International Journal of Progressive Education

Frequency: Six times a year.

ISSN: 1554-5210

Owner & Publisher: International Association of Educators

Indexing/Abstracting:

1. OCLC-WorldCat: http://www.oclc.org/worldcat/default.htm
3. EBSCO Publication: http://www.ebsco.com
5. ERIC: http://www.eric.ed.gov
6. ERIH Plus: https://dbh.nsd.uib.no/publiseringskanaler/erihplus/

2022 Subscription Rates

- $35 Association Member USA (Canada: $40; Rest of World: $50)
- $45 Individual USA (Canada: $50; Rest of World: $55)
- $35 Student USA (Canada: $40; Rest of World: $50)
- $140 Library/Institution USA (Canada: $160; Rest of World: $160)

Single Issues and Back Issues: $25 USA (Canada: $35; Rest of World: $35)

If you wish to subscribe for the printed edition of IJPE, please contact the Customer Service department at secretary@inased.org
Editor
Hakan Dedeoglu
Hacettepe University, Turkey

Associate Editor
Bertram Chip Bruce
University of Illinois at Urbana-Champaign, USA
Chen Xinren
Nanjing University, China

Managing Editor
Mustafa Yunus Eryaman
Çanakkale Onsekiz Mart University, Turkey

Assistant Managing Editors
Nihat Gurel Kahveci
Istanbul University, Turkey
Alex Jean-Charles
Missouri State University, USA

Editorial Review Board (Board of Referees)
Peggy Placier
University of Missouri-Columbia, USA
Yang Changyong
Southwest China Normal University China
Sharon Tettegah
University of California, Santa Barbara USA
Fernando Galindo
Universidad Mayor de San Simón, Bolivia
Susan Matoba Adler
University of Hawaii, USA
Carol Gilles
University of Missouri-Columbia, USA
Julie Matthews
University of the Sunshine Coast, Australia
Cushla Kapitzke
Queensland University of Technology, Australia
Catalina Ulrich
Universitatea din Bucuresti, Romania
Juny Montoya
Universidad de Los Andes, Bogotá, Colombia
Kwok Keung HO
Lingnan University, Hong Kong
CHAN, Raymond M C
Hong Kong Baptist University
Winston Jumba Akala
University of Nairobi, Kenya
Pragasi Sithithikul
Walaalak University, Thailand
Funda Savasci
Istanbul University, Turkey
Sheila L. Macrine
University of Massachusetts Dartmouth, USA
Raul Alberto Mora Velez
University of Pontificia Bolivariana, Columbia
Van-Anthoney Hall
University of Illinois at Urbana-Champaign, USA
Pauline Sameshima
Lakehead University, Canada
Bongani Bantwini
University of Venda, South Africa
Martina Riedler
Canakkale Onsekiz Mart University, Turkey
John L. Pecore
University of West Florida
Levent Cetinkaya
Canakkale Onsekiz Mart University, Turkey
Yasser A. Al-Hilawani
Yarmouk University, Jordan

Advisory Board
Naomi Tsunematsu
Hiroshima University, Japan
Lu Youquan
East China Normal University, China
Ma Hemin
East China Normal University, China
Chrispen Matsika
Georgia College&State University
Jeylan Wohiy Hussein
Alemaya University, Ethiopia

The views expressed in this publication are not necessarily those of the Editor or the Editorial Review Board, nor the officers of the International Association of Educators (INASED). Copyright, 2022, International Association of Educators (INASED). ISSN 1554-5210
# TABLE OF CONTENTS

Volume 18, Number 1
February 2022

**Articles**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>A Study of English Intercultural Learning Experience of Thai Tertiary English Majors</td>
<td>Kewalin Jantadej</td>
</tr>
<tr>
<td>22</td>
<td>Reading Difficulty and Development of Fluent Reading Skills: An Action Research</td>
<td>Osman Gedik, Hayati Akyol</td>
</tr>
<tr>
<td>42</td>
<td>Investigation of the Correlation Between Self-Esteem and Coping Strategies of Students Attending Secondary School</td>
<td>Esin Özer, Hamdi Korkman</td>
</tr>
<tr>
<td>52</td>
<td>Identifying the Values to be acquired by the Students in Inclusive Classrooms based on the Views of the Classroom Teachers</td>
<td>Tansel Yazıcıoğlu, Vedat Aktepe</td>
</tr>
<tr>
<td>65</td>
<td>The Reasons of Syrians Learning Turkish as a Second Language, Their Perceptions of Turkey and Their Future Expectations</td>
<td>Önder Çangal</td>
</tr>
<tr>
<td>85</td>
<td>Teaching the Alternative Ceramic Firing Techniques to Preservice Visual Arts Teachers: A Case Study</td>
<td>Berna Coskun Onan, Tulin Ozturk</td>
</tr>
<tr>
<td>114</td>
<td>The Relationship Between Preservice Teachers' Critical Thinking and Epistemological Beliefs</td>
<td>Cafer Çarkıt, Hasan Kurnaz</td>
</tr>
<tr>
<td>128</td>
<td>Teaching Experiences of Science Teachers Working in Schools for the Visually Impaired</td>
<td>Tamer Karakoç, Cem Aslan</td>
</tr>
<tr>
<td>147</td>
<td>Designing Technological Content Curriculum Materials Supported by Logger Pro: An Action Research</td>
<td>Ahmet Kumaş</td>
</tr>
<tr>
<td>174</td>
<td>The Effects of Children’s Rights and Democracy Education on Children’s Democratic Behaviors</td>
<td>Sevi Kent Küükürtçu, Nefise Semra Erkan</td>
</tr>
<tr>
<td>194</td>
<td>Primary School Students' Images of Scientists and the Sources of These Images</td>
<td>Ebru Buket Aygun, Suat Celik</td>
</tr>
<tr>
<td>210</td>
<td>Determining the Metaphor Perceptions of Generation Z Teacher Candidates for Handwriting and Keyboarding (Typing)</td>
<td>Zeynep Aydemir</td>
</tr>
<tr>
<td>229</td>
<td>Classroom Teachers' Expectations from Pre-School Education on the Process of Preparation for Literacy: An Exploratory Sequential Design Study</td>
<td>Mehmet Soyuçok, Yakup Balantekin</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>249</td>
<td>Investigation of the Effectiveness of Hybrid Learning on Academic Achievement: A Meta-Analysis Study</td>
<td>İbrahim Yaşar Kazu, Cemre Kurtoğlu Yalçın</td>
</tr>
<tr>
<td>266</td>
<td>Leader Administrator: A Qualitative Analysis Based on Teacher Opinions</td>
<td>Ramazan Ertürk</td>
</tr>
<tr>
<td>285</td>
<td>Investigating Speaking Performance in Terms of Cultural Capital</td>
<td>Onur Dölek, Salih Kürşad Dolunay</td>
</tr>
<tr>
<td>298</td>
<td>Analysis of the Pedagogical Content Knowledge Development of Prospective Teachers in the Lesson Plan Development Process: 4MAT Model</td>
<td>Feyza Aliustaoglu, Abdulkadir Tuna</td>
</tr>
<tr>
<td>322</td>
<td>A Study on the Impact of Readability on Comprehensibility</td>
<td>Halil İbrahim Öksüz, Hasan Kağan Keskin</td>
</tr>
<tr>
<td>336</td>
<td>Analyzing Teacher and Parent Views on the First Literacy Process During the Covid-19 Pandemic</td>
<td>Başak Kasa Ayten, Murat Ercan</td>
</tr>
<tr>
<td>362</td>
<td>Towards a Re-conceptualisation of the Role of Teacher Educators in a Changing World</td>
<td>Sibel Akin-Sabuncu</td>
</tr>
<tr>
<td>379</td>
<td>Investigating research trends on digital storytelling: A Bibliometric and visualized analysis</td>
<td>Perihan Gülce Özkaya</td>
</tr>
<tr>
<td>397</td>
<td>Primary School Teachers’ Perceptions of Digital Culture</td>
<td>Nur Özge Menşan, Şengül Saime Anagün</td>
</tr>
<tr>
<td>411</td>
<td>Reformatory Shift on Initial Teacher Education in Turkey: From Authority to Autonomy</td>
<td>Semra Tican Başaran, Bilge Aslan Altan, Kerim Gündoğdu</td>
</tr>
<tr>
<td>435</td>
<td>A Study of the Effects of Parental Attention Deficit and Hyperactivity Disorder (ADHD) and Parental Emotion Regulation Processes on Adolescent Self-Regulation Skills</td>
<td>Zeynep Gültekin Ahçi, Seher Akdeniz, Hatice Harmançı</td>
</tr>
<tr>
<td>448</td>
<td>The Impact of Cognitive and Affective Components of Test Anxiety on the High-Stakes Exam Performance in 12th Grade Students</td>
<td>Yusuf Ziya Kültür, Bahadır Özcan</td>
</tr>
<tr>
<td>458</td>
<td>Society 5.0 in Human Technology Integration: Digital Transformation in Educational Organizations</td>
<td>Zübeysde Yaras, Fikriye Kanathli-Öztürk</td>
</tr>
<tr>
<td>475</td>
<td>Investigation of Pedagogical Belief Systems and Teacher Efficacy of Teachers in Turkey</td>
<td>Derya Yüreğilli Göksu, Volkan Duran</td>
</tr>
</tbody>
</table>
A Study of English Intercultural Learning Experience of Thai Tertiary English Majors*

Kewalin Jantadej
Lampang Rajabhat University

Abstract
This study examined the English intercultural learning experience of 63 fourth-year Thai tertiary English majors through the students’ evaluation form, which included the Likert scale questionnaire, checklists, and open-ended questions. The questionnaire’s findings showed that the English majors evaluated gaining an English intercultural learning experience to a moderate amount. Then, the checklists’ findings informed that they mostly noticed learning cultures when the teachers used online media, shared experiences or viewpoints, and offered them to discuss cultural issues in the classroom. Finally, the open-ended questions’ results stressed that the participants required more opportunities to communicate in English, be familiar with varieties of English, and learn their native English teacher’s culture. Although they experienced learning target and foreign countries’ cultures from a Thai English language teacher to a large amount, they felt inferior to those countries and noticed the lack of promoting home cultural value in the classroom. The findings suggested that teachers should monitor themselves to ensure that they inspire students to be proud of their identity and nation before valuing others. Otherwise, students may be unable to express appreciation of their national identity to the world and lack a prerequisite qualification of the global-ready graduates—desirable national citizenship.

Keywords: English intercultural learning experience, Intercultural competence, English language learning, Global-ready graduates, English Majors

DOI: 10.29329/ijpe.2022.426.1

* This article is a part of a research report submitted to the Faculty of Humanities and Social Sciences, Lampang Rajabhat University, Lampang, Thailand.

1 Kewalin Jantadej, Dr., Humanity and Social Sciences, Lampang Rajabhat University, ORCID: 0000-0003-0390-0859

Email: ajarnjoy@yahoo.com
INTRODUCTION

In order to accept differences among all humankind, “We must learn to live together as brothers or perish together as fools.”, the quote from Martin Luther King, Junior. We are obligated to learn to maintain relationships to address the problems that run into us as humanity. Intercultural learning seems to be one of the best ways that fulfills this obligation. As intercultural learning focuses on preparing global-ready graduates for the 21st Century, learners will be trained to realize how culture affects language usage, the way they look at others, and by what means people from other cultures may interpret them (Deardorff & Jones, 2012). This awareness requires experience in examining their prejudices against differences and having a positive attitude about cultural issues to cultivate intercultural competence (IC). Then, IC facilitates global-ready graduates who negotiate meaning effectively and act appropriately in intercultural realms (McRae, Ramji, Lu, & Lesperance, 2016).

Considering English language teaching (ELT) in Thailand, English intercultural learning is an implicit requirement embedded in the national standards for higher education. For instance, learners must have “desirable characteristics of the Thai people as both citizens of the country and member of the world community” (OHEC, 2010, p 18). Another is, by the year 2036 learners must have critical thinking and lifelong learning skills that fit the 21st Century, have good culture realization, appreciate the value of Thai identity, respect the community, nation, and the royal family (Office of National Education Council, 2016). These requirements call for active actions and strategies from higher education institutions to provide learners with an English intercultural learning experience. Such experience will enable them to appreciate taking roles of national, regional, and global citizenry.

Concerning the aforementioned Thailand national requirements, how can we agree that Thai tertiary English majors sufficiently experience English intercultural learning that develops their IC. Since several studies of Thai scholars such as Laopongharn and Sercombe (2009); Rajani Na Ayuthaya and Sitthitikul (2016); Wannaruk (2008) confirmed that Thai tertiary English majors had a low level of IC and English speaking proficiency. These may have been caused by teachers failed to take account of IC in ELT and struggling to an absolute monopoly for successful communication—the NS model. Accordingly, learners lack experience using knowledge, attitudes, and skills to support interaction with diverse English users. Finally, they tend to frustrate and decline to use English (Matsuda & Friedrich, 2011).

With these critical conditions, it is significant to examine Thai tertiary English majors’ English intercultural learning experience to discover the problems that may hinder their IC development. The findings may direct the implementation of English intercultural teaching that effectively prepares students to become global-ready graduates for the 21st Century.

Aims and Research Questions

This study aimed to investigate the level of English intercultural learning experience of the fourth-year English majors before going out for a professional practicum, components of English intercultural learning the students found in their classroom, and their constructive comments for English intercultural Knowledge, Attitudes, and Skills learning. The two research questions (RQ) elicited the findings of this study:

RQ1: How much do the fourth-year tertiary English majors gain English intercultural learning experience from their English courses?

RQ2: In what way do the fourth-year tertiary English majors experience English intercultural learning from their English courses?
Literature Review

Intercultural learning and IC

Intercultural learning is the mechanism of growing to comprehend the differences between home culture and other cultures through IC (Deardorff & Jones, 2012). Several intercultural mavens such as Bennett (1986); Byram (1997); Deardorff (2012), and others designate IC for language learning as learners’ abilities to use knowledge, attitudes, and skills to understand the home culture, interpret other cultures, compare and relate those cultures to their own, and communicate with people of any cultures effectively and appropriately. In detail, attitudes are the beginning of progress that later expedite knowledge and skills necessary for IC development (Byram, 1997; Deardorff, 2012). Good attitudes construct curiosity to learn other cultures, readiness to step out of one’s safety boundary, appreciation of the home culture, and awareness of others (Baker, 2009; Bennett, 1993).

Next is knowledge, which reminds learners that differences among all humankind come from the values, culture, beliefs, and norms of their homeland. Once learners understand this basis, they tend not to judge the rest of the world from their home backgrounds (Deardorff, 2012; Kramsch, 2006).

For skills, learners must practice comparing, analyzing, interpreting, relating other cultural perspectives to their own, and communicating in intercultural situations to understand others from the world’s views. These practices can diminish their ethnocentric view and overcome prejudice against others by accepting, respecting, and adapting (Bennett, 1993; Byram, 1997; Deardorff 2012).

Framework for implementing English intercultural teaching

Jantadej (2019) developed a framework to guide Thai English language teachers in implementing English intercultural teaching to develop students’ IC that covers both the teaching and assessment on Knowledge, Attitudes, and Skills. They are Sociolinguistic teaching and assessment, Cultural self-knowledge teaching and assessment, Specific cultural knowledge teaching and assessment, Universal cultural knowledge teaching and assessment, Global events knowledge teaching and assessment, Openness attitude teaching and assessment, Respect attitude teaching and assessment, Withholding-judgment attitude teaching and assessment, Comparing & Analyzing skill teaching and assessment, Communicating skill teaching and assessment, and Behavior skill teaching and assessment. Jantadej also recommends this framework for other countries that have similar ELT contexts.

Learning tasks for developing IC

Intercultural scholars recommend the following learning tasks to foster learners’ IC.

The first one is communicative tasks. This kind of task allows learners to compare, differentiate, analyze, or interpret between cultures within one. All the communicative tasks focus on stimulating the use of meaningful language under the real speaking basis, which meets the process of developing IC (Bilash, 2011; Cotter, 2016).

The second one is reflection tasks, which allow learners to see similarities and differences of home culture to the one in the text. One example is an Action Log. It reflects English writing ability and critical thinking in expressing feelings, comments, comparison, and understanding of cultural content or tasks learners have learned and done in class (Corbett, 2007). It also yields productive feedback to the teachers on how hard or efficient each lesson was. Another is Reformulation which improves learners’ listening and speaking skills and evaluates their cultural understanding of the text by retelling things they just learned or reviewing things they have missed with a partner (Cullen & Sato, 2000).
The third one is role-playing. It is a fruitful task which aids learners to join in various social situations. Performing role-plays could broaden learners’ worldviews in interpreting others’ language and behavior that gradually lead them to become effective communicators (Dorathy & Mahalakshmi 2011). These qualities are necessary for IC development.

The fourth one is discussion tasks, which encourage learners to talk about objectives or hidden meanings of the text with peers. It helps them tolerate and respect their interlocutors’ viewpoints, and be confident to join an intercultural conversation. Dorathy and Mahalakshmi (2011) suggested two skillful discussion tasks: Noticing and Prediction. Noticing can use when learners watch a scenario. Then, teachers ask them to ‘notice’ focal issues and compare them with their home culture. For Prediction, while teachers are telling a story, they may pause at a certain point. Then, ask learners to predict what will happen next. It will trigger their critical thinking and intense desire to know if their prediction is correct.

**Cultural information resources**

English language teachers should bring cultural information from various sources to the classroom to reflect different angles, feelings, messages, and interpretations to learners. Regarding this, Cullen and Sato (2000) proposed some crucial sources of cultural information such as video, TV, readings, Internet, stories, learners experience, songs, newspapers, interviews, guest speakers, anecdotes, souvenirs, photographs, surveys, or literature. Additionally, Khosrowjerdi, Sundqvist, and Byström (2019) included Blogs, online social media discussions, search engine news, online news services, TV shows, personal discussions, email exchanges, and newspapers (including online versions) as of current cultural information resources of their respondents.

In all likelihood, a proper English intercultural teaching framework, skillful design learning tasks, and effective sources of cultural information are parts of things teachers can do to create learners’ intercultural learning experience that broadens their worldviews and sharpens their communication, reflection, comparison, and discussion skills.

**Related studies to students’ intercultural learning experience**

In the USA, Klein (2004) reported that students experienced learning cultural facts separately from linguistic learning, which was an ineffective method to enhance students’ IC.

In Korea, Jon (2009) uncovered that Korean students experienced learning cultural differences and intercultural worldviews from communicating with international students.

In China, Newton and Shearn (2010) found that though cultural awareness had been one of the ELT objectives in China since 2006, students inadequately gained experience in intercultural learning and mainly learned cultural facts.

In Vietnam, Ho Si Thang Kiet (2011) showed that students merely experienced intercultural learning in English classrooms from comparing their culture to the target culture.

In Thailand, Jantadej (2019) unveiled that secondary school students had a low intercultural learning experience, especially on attitudes and skills. Besides, Kawsa-ard (2018); Wichien and Aksornjarung (2011) disclosed that famous EFL textbooks in Thailand offered students a small number of tasks to experience intercultural learning in comparing, expressing respect and value, and relating similarities and differences of others to Thai.

In sum, learners’ intercultural learning experience remains in a peripheral status as long as they lack sufficient instructions and learning materials that actively advocate their IC.
Conceptual framework

The conceptual framework framed the research instrument for evaluating participants’ English intercultural learning experience in three main categories. The first category covered 11 components (five components of Knowledge, three components of Attitudes, and three components of Skills) that create students’ English intercultural learning experience (synthesized from Jantadej, 2019). In detail, the Knowledge learning carried 1) Sociolinguistics 2) Cultural self-knowledge 3) Specific cultural knowledge 4) Universal cultural knowledge, and 5) Global events knowledge. The Attitudes learning included 6) Openness 7) Respect, and 8) Withholding-judgment. The Skills learning encompassed 9) Comparing & Analyzing 10) Communicating, and 11) Behavior.

The second category was the sources of classroom cultural information that promote participants’ English intercultural learning (Cullen & Sato, 2000; Khosrowjerdi et al. 2020), such as textbooks, teacher’s experiences/viewpoints or instructions, readings, literature, anecdotes, photographs, online resources, and others.

The third category was the 20 learning tasks for developing IC classified by four main tasks—communicative, reflection, role-playing, and discussion tasks (Bilash, 2011; Cullen & Sato, 2000; Dorathy & Mahalakshmi; 2011). Communicative tasks included (Task 1) practice using the language in each situation, and (Task 2) an interview. Reflection involved (Task 3) write an action log, (Task 4) reformulate a story, (Task 5) express opinions, (Task 6) practice exercises, (Task 7) express viewpoints on learning cultural differences, (Task 8) summarize a degree of acceptance towards other cultures, (Task 9) compare & analyze perspectives or values of any particular cultures to Thai, and (Task 10) share students’ experiences.

Role-playing tasks contained (Task 11) perform a role-play, a simulation, or a debate on a given social situation. Discussion tasks were comprised of (Task 12) analyze the use of language, (Task 13) provide a ‘noticing’ to a given material, (Task 14) provide a ‘prediction’ to a given material, (Task 15) interpret values, viewpoints, and objectives of interlocutors, (Task 16) discuss perspectives or values, (Task 17) discuss the advantages of learning different cultures, (Task 18) specify misunderstanding aspects between Thai and other cultures, (Task 19) identify areas of similarities and differences between cultures, and (Task 20) analyze a problem of communication in each social event.

METHODOLOGY

Participants

Participants were the 63 fourth-year English majors enrolled in one university in the northern province of Thailand. They were selected using the purposive sampling technique.

Data Collection

In September 2020, a consent form was distributed to the English majors. Only ones who agreed to participate in the study gave informed consent and were guaranteed to keep their identity confidentially. After receiving informed consent from the participants (N=63), a set of the English Intercultural Learning Experience: Students’ Evaluation Form was distributed to them. Before making an evaluation, the researcher explained directions, statements, and questions in the evaluation form to the participants to ensure their understanding. Finally, 63 completed students’ evaluation forms were returned to the researcher. The form was comprised of two parts. Part I contained four columns. Column#1 was an 11-statement that described each English intercultural learning component. Column#2 was a four-point Likert scale for evaluating the 11 statements in column#1, which focused on the degree of English intercultural learning experience the participants gained from the English courses, ranging from a Large amount of experience (4), a Moderate amount of experience (3), a Small amount of experience (2), and No experience (1). Column#3 was the checklists of cultural information.
the teachers used in the classroom. Column #4 was the checklists of 20 learning tasks that promoted students’ English intercultural learning experience.

Part II contained three open-ended questions that elicited participants’ comments on English intercultural Knowledge learning (question 1), Attitudes learning (question 2), and Skills learning (question 3) from the English courses they learned.

Data Analysis

The quantitative data from the four-point Likert scale and Checklists were analyzed using descriptive statistics to give a general impression of the answer patterns. Subsequently, the qualitative data from an open-ended part were analyzed by the content analysis to reaffirm the quantitative results, followed by findings and discussion.

FINDINGS AND DISCUSSION

RQ 1: How much do the fourth-year tertiary English majors gain English intercultural learning experience from their English courses?

The evaluation scores from 63 fourth-year tertiary English majors were classified into four categories using Arithmetic Means—a Large amount of experience (M = 3.26-4.00), a Moderate amount of experience (M = 2.51-3.25), a Small amount of experience (M = 1.76-2.50), and No experience (M = 1.00-1.75). The results are displayed in Table 1.

<table>
<thead>
<tr>
<th>English Intercultural Learning Experience</th>
<th>LE</th>
<th>ME</th>
<th>SE</th>
<th>NE</th>
<th>M (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Learn the use of English in social situations</td>
<td>28</td>
<td>32</td>
<td>2</td>
<td>1</td>
<td>3.38 (63)</td>
</tr>
<tr>
<td>2. Learn surface and deep culture of Thailand</td>
<td>0</td>
<td>7</td>
<td>26</td>
<td>30</td>
<td>1.63 (63)</td>
</tr>
<tr>
<td>3. Learn surface and deep culture of one particular country</td>
<td>18</td>
<td>43</td>
<td>1</td>
<td>1</td>
<td>3.25 (63)</td>
</tr>
<tr>
<td>4. Learn general practices, values, beliefs, or phenomena that similar to all culture</td>
<td>30</td>
<td>30</td>
<td>2</td>
<td>1</td>
<td>3.41 (63)</td>
</tr>
<tr>
<td>5. Learn current global impact news</td>
<td>0</td>
<td>6</td>
<td>32</td>
<td>25</td>
<td>1.70 (63)</td>
</tr>
<tr>
<td>Scores Interpretation: A Moderate amount of Knowledge learning experience</td>
<td>2.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II: Attitudes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Learn to open mind to cultural differences</td>
<td>28</td>
<td>31</td>
<td>3</td>
<td>1</td>
<td>3.37 (63)</td>
</tr>
<tr>
<td>7. Learn to respect Thai and other cultures</td>
<td>0</td>
<td>29</td>
<td>32</td>
<td>2</td>
<td>2.43 (63)</td>
</tr>
<tr>
<td>8. Learn not to criticize or judge any cultures</td>
<td>0</td>
<td>7</td>
<td>23</td>
<td>33</td>
<td>1.59 (63)</td>
</tr>
<tr>
<td>Scores Interpretation: A Small amount of Attitudes learning experience</td>
<td>2.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III: Skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Practice comparing and analyzing similarities and differences between cultures</td>
<td>22</td>
<td>38</td>
<td>2</td>
<td>1</td>
<td>3.30 (63)</td>
</tr>
<tr>
<td>10. Practice speaking English in different social situations</td>
<td>36</td>
<td>24</td>
<td>1</td>
<td>2</td>
<td>3.49 (63)</td>
</tr>
<tr>
<td>11. Practice social acting through a role-playing</td>
<td>2</td>
<td>28</td>
<td>20</td>
<td>13</td>
<td>2.30 (63)</td>
</tr>
<tr>
<td>Scores Interpretation: A Moderate amount of Skills learning experience</td>
<td>3.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Interpretation: A Moderate amount of English intercultural learning experience</td>
<td>2.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: LE = a Large amount of experience; ME = a Moderate amount of experience; SE = a Small amount of experience; NE = No experience; M = Mean; n = Total number of responses

The overall findings in Table 1 showed that the participants experienced a moderate amount of English intercultural learning from their English courses of the last semester. The areas that they gained a large amount of experience covered Sociolinguistics (item 1, M=3.38), Universal cultural...
knowledge (item 4, M=3.41), Openness (item 6, M=3.37), Comparing & Analyzing (item 9, M=3.30), and Communicating (item 10, M=3.49).

These results were likely to cause by the English courses they learned were relevant to public speaking and contemporary literature that aimed to promote skills in speaking and interpreting social practices or conventions that are universally understood. Also, one teacher was a native speaker while another one was a Thai who had long been living and studying in an English-speaking country. Therefore, these two teachers could provide actual forms of the language used in several social situations to their students as they were more familiar with the mobility of the language. Accordingly, they tended to fully aware of promoting Universal cultural knowledge, Comparing & Analyzing, and Communicating skills to their students.

Part of the findings was similar to Bhudharuksa (2011). Bhudharuksa found that most Thai English language teachers reflected that they frequently addressed daily life language and social situations when teaching culture. Likewise, Jantadej and Charubusp (2018) disclosed that Grades 7 and 8 Thai English language teachers provided the knowledge of the language used in different social situations, and communicative teaching to the greatest extent in their classrooms. These findings resembled the study of Sercu (2004) that the use of language, daily routine, new generation’s culture, future careers, way of life, and education were largely mentioned in the classroom by foreign language teachers.

Moving back to the results of this present study, Specific cultural knowledge (item 3, M=3.25) was the only area that the participants had a moderate amount of learning experience. Then the areas that they gained a small amount of experience were Respect attitude (item 7, M=2.43) and Behavior skill (item 11, M=2.30). At last, the areas that the participants had no experience at all were Cultural self-knowledge (item 2, M=1.63), Global events knowledge (item 5, M=1.70), and Withholding-judgment attitude (item 8, M=1.59).

Part of the findings on the least and lacked teachers’ support on cultural attitudes corresponded to Sercu (2006). Sercu discovered that foreign language teachers in seven countries disdained reinforcing cultural attitudes in their classroom as they presumed that students were inspired to learn other cultures by consuming massive kinds of media and had good attitudes towards the culture they learned. In the same vein, Jantadej (2019) revealed that the teacher participants in her study provided attitudes endorsement to the lowest extent, and none of the evidence concerning withholding home culture judgments found in their classroom. Apart from this, Hu and Gao (1997) emphasized the teachers misled their students into cultural judgment that caused stereotyping towards some particular cultures.

Whether teachers mislead or leave out attitudes cultivation, learners would find hardship in expressing respect and value or withholding-judgment towards their own and other cultures. Therefore, this finding suggested that attitudes reinforcement should intensely cultivate while giving learners an English intercultural learning experience.

Nonetheless, the students lacked cultural self-knowledge learning experience in this present study did not conform to Thumvichit (2018). Thumvichit reported that teacher respondents promoted students' local culture appreciation by integrating teaching materials that encouraged them to express their own culture in English. About this, Jantadej (2019) argued that her teacher participants perceived that they emphasized their students to proud of Thai identity before admiring the others, but very few of them mentioned Thai culture and promoted self-identity to their students in the actual classroom. One of the participants neither stated nor compared any cultures to Thai. Based upon the teachers' ignorance in that case can be inferred that what teachers perceived was not what they all performed in their actual teaching context. Resulting, those teachers failed to cultivate students with the appreciation of home culture.
The last absent area of the participants’ learning experience was the Global events knowledge (item 5). Perhaps, teachers assumed that students were previously aware of global crises or events; they did not mention it in the classroom. However, we cannot deny that the 21st Century learners must alert on perceiving the world around them, offering condolences to sufferers, preparing for the impacts, and finding out the solutions. Consequently, Jantadej (2019) recommends English language teachers bring some global issues to discuss in the classroom to sharpen students’ critical thinking and promote their global consciousness.

In short, this part’s findings implied that the teachers took for granted the students’ home culture, cultural attitudes reinforcement, and global impact discussion in their teaching.

The following part demonstrates sources of classroom cultural information and learning tasks the teachers used to promote students’ English intercultural learning experience.

Table 2: Students’ English intercultural learning experience sorted by sources of classroom cultural information and learning tasks

<table>
<thead>
<tr>
<th>English Intercultural Learning</th>
<th>Sources of Classroom Cultural Information</th>
<th>Learning Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge</td>
<td>44.4% from the teacher’s experiences/viewpoints or instructions</td>
<td>71.4% Task 12. identify and analyze the use of language</td>
</tr>
<tr>
<td>(M= 3.38)</td>
<td>31.7% from readings, literature, anecdotes, photographs</td>
<td>50.8% Task 15. interpret &amp; evaluate values, viewpoints, and objectives of interlocutors</td>
</tr>
<tr>
<td>☑ a Large amount of experience</td>
<td>22.4% from online resources not mentioned</td>
<td>34.9% Task 16. discuss the perspective or values</td>
</tr>
<tr>
<td></td>
<td>1.5% not mentioned</td>
<td>1.5% No task</td>
</tr>
<tr>
<td>2. Cultural self-knowledge</td>
<td>5.6% from the teacher’s experiences/viewpoints or instructions</td>
<td>100% No task</td>
</tr>
<tr>
<td>(M= 1.63)</td>
<td>5.6% from online resources</td>
<td></td>
</tr>
<tr>
<td>☑ No experience</td>
<td>88.8% not mentioned</td>
<td></td>
</tr>
<tr>
<td>3. Specific cultural knowledge</td>
<td>63.4% from textbook</td>
<td>85.7% Task 4. reformulate a story</td>
</tr>
<tr>
<td>(M= 3.25)</td>
<td>31.7% from the teacher’s experiences/viewpoints or instructions</td>
<td>92% Task 5. express opinions and viewpoints</td>
</tr>
<tr>
<td>☑ a Moderate amount of experience</td>
<td>4.9% from online resources</td>
<td>12.6% Task 10. share students own experiences</td>
</tr>
<tr>
<td></td>
<td>4.9% not mentioned</td>
<td>26.9% No task</td>
</tr>
<tr>
<td>4. Universal cultural knowledge</td>
<td>47.6% from the teacher’s experiences/viewpoints or instructions</td>
<td>12.7% Task 10. share students own experiences</td>
</tr>
<tr>
<td>(M= 3.41)</td>
<td>23.8% from readings, literature, anecdotes, photographs</td>
<td>15.8% Task 14. provide a prediction to a given material</td>
</tr>
<tr>
<td>☑ a Large amount of experience</td>
<td>4.7% from online resources not mentioned</td>
<td><strong>88.8% Task 15. interpret &amp; evaluate values, viewpoints, and objectives of interlocutors</strong></td>
</tr>
<tr>
<td></td>
<td>4.7% not mentioned</td>
<td>80.9% Task 16. discuss the perspective or values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26.9% Task 18. specify misunderstanding aspects between Thai and other cultures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>76.2% Task 19. identify areas of similarities and differences between cultures</td>
</tr>
<tr>
<td>5. Global events</td>
<td>10% from textbook</td>
<td>4.7% No task</td>
</tr>
<tr>
<td>(M= 1.70)</td>
<td>90% not mentioned</td>
<td>100% No task</td>
</tr>
<tr>
<td>II: Attitudes</td>
<td>6. Openness (M= 3.37)</td>
<td>a Large amount of experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Respect (M= 2.43)</td>
<td>a Small amount of experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Withholding-judgment (M= 1.59)</td>
<td>No experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III: Skills</td>
<td>9. Comparing &amp; Analyzing (M= 3.30)</td>
<td>a Large amount of experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. Communicating (M= 3.49)

<table>
<thead>
<tr>
<th>Experience</th>
<th>Experience/Viewpoints or Instructions</th>
<th>Experience/Viewpoints or Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Large amount of experience</td>
<td>47.6% from the teacher’s experiences/viewpoints or instructions</td>
<td>4.8% from readings, literature, anecdotes, photographs</td>
</tr>
<tr>
<td></td>
<td>47.6% from online resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68.2% Task 1. practice using the language in each situation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>96.8% Task 5. express opinions and viewpoints</td>
<td></td>
</tr>
<tr>
<td></td>
<td>73% Task 9. compare &amp; analyze perspective or values between Thais and any particular cultures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22.2% Task 10. share students own experiences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65% Task 16. discuss the perspective or values</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17.5% Task 20. identify and analyze a problem of communication in each social event</td>
<td></td>
</tr>
</tbody>
</table>

11. Behavior (M= 2.30)

<table>
<thead>
<tr>
<th>Experience</th>
<th>Experience/Viewpoints or Instructions</th>
<th>Experience/Viewpoints or Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Small amount of experience</td>
<td>25.4% from the teacher’s experiences/viewpoints or instructions</td>
<td>74.6% not mentioned</td>
</tr>
<tr>
<td></td>
<td>100% No task</td>
<td></td>
</tr>
</tbody>
</table>

Note: Communicative tasks include (Tasks 1-2), Reflection tasks include (Tasks 3-10), Role-playing tasks include (Task 11), and Discussion tasks include (Tasks 12-20).

Overall results in column#1 are taken from Table 1. Comparing five areas of English intercultural learning that the participants gained a large amount of experience in column#1 to column#2 found that teachers’ own experience, viewpoints, and classroom instructions were used as classroom cultural information for 44.4% to promote participants’ Sociolinguistics (item 1). They were used for 47.6% to promote participants’ Universal cultural knowledge (item 4), 49.2% to promote Openness attitude (item 6), 95.2% to promote Comparing & analyzing skills (item 9), and 47.6% to promote Communicating skill (item 10). Also, online resources were used as classroom cultural information for 47.6% to promote participants’ Communicating skills (item 10).

Nevertheless, the participants perceived that the teachers rarely used textbooks, readings, literature, anecdotes, and photographs as sources of classroom cultural information to provide them English intercultural learning experience.

As to the learning tasks in column#3, though the participants recognized doing all the nine tasks under discussion tasks in the classroom, only five of them could raise participants’ experience to a large amount on four areas of intercultural learning. In detail, 71.4% of the participants perceived learning Sociolinguistics (item 1) through (Task 12) identifying and analyzing the language used from the given materials. 88.8% perceived learning Universal cultural knowledge (item 4) through (Task 15) interpreting & evaluating values, viewpoints, and objectives of interlocutors. 96.8% and 93.6% of them perceived learning Openness attitude (item 6) through (Task 16) discussing the perspectives or values in the given situations, and (Task 20) identifying and analyzing a problem of communication in each social event. 98.4% perceived learning Comparing & analyzing skill (item 9) through (Task 19) identifying areas of similarities and differences between cultures.

In addition, among six tasks under reflection tasks the participants had done in the class, Communicating skill (item 10) was only one area they gained a large amount of experience. To elaborate, 96.8% of them perceived that they practiced (Task 5) expressing opinions and viewpoints toward intercultural issues in the classroom.

However, it was noticed that (Task 2) an interview was the only task under communicative tasks that the teachers abandoned in their classrooms. As well as (Task 3) an action log, it was disappeared from the reflection tasks. Moreover, the role-playing was another type of task that participants had never performed in class at all.
RQ2: In what way do the fourth-year tertiary English majors experience English intercultural learning from their English courses?

The student participants wrote down their suggestions and comments on the English intercultural Knowledge, Attitudes, and Skills learning from the English courses in Part II of the English Intercultural Learning: Students’ Evaluation Form.

About the Knowledge learning, 55.5% of the participants desired to see the significance of Thai culture from the literature course rather than admiring other cultures. Based on their desire, it can be concluded that the students realized the fade of Cultural self-knowledge (item 2) in their classroom. For example:

“I wished to hear and appreciate more of Thai culture in the literature class because the teacher told me a lot about other cultures.”

“I wished the teacher looked at Thai culture and mentioned it more in the literature class.”

Another was the Global events knowledge (item 5) which participants rated no experience learning at all. However, it turned out that they paid the least attention to this area as well. Only 7.9% of them desired to learn more about global news to perceive global impacts on cultural differences. For example:

“I wish the teachers talked about the current global impacts that involved cultural differences.”

For the Attitudes learning, most participants (63.4%) noticed the missing of the Withholding-judgment attitude (item 8) from the literature course. They stated that the teacher represented the Thai culture in a way that inferior to other cultures. Some of them were frustrated and wanted to see the positive side of Thai culture. It was likely to be the reason the participants rated not experienced the Withholding-judgment attitude at all in the evaluation form. Some of their comments are as follows:

“I was frustrated by the way the Thai teacher thought that other cultures were better than Thai culture.”

“I disagreed with the Thai teacher’s opinion when she gave negative comments on Thai culture and made us felt like other cultures were okay except Thai culture.”

“The teacher herself should have taught students to have good cultural attitudes, especially to our culture.”

“The teacher should have readjusted students’ and her perspectives before teaching and learning cultures.”

Also, 55.5% of the participants focused on the lack of Respect attitude (item 7) cultivation in the literature course. These are some examples of their comments:

“The teacher sounded sarcastic every time she talked about Thai culture or stories.”

“I wished the teacher encouraged students to respect Thai culture. Not making a joke or mentioned ridiculous stories of the Thai.”

“I wish the Thai teacher had more respect for her own culture, not just for other cultures or the target culture.”
As to Skills learning, although the participants gained a large amount of experience in both Comparing & Analyzing (item 9) and Communicating (item 10) skills from the English courses, they remained to ask for more classroom tasks in these two areas.

46% raised their requests on Comparing & Analyzing skill as these following examples:

“I wished to practice more on comparing my own culture to my native English teacher’s culture.”

“I wished the teachers assigned more tasks to analyze about cultural aspects and lifestyles of other countries.”

“The teachers should have added more current case studies of cultural differences.”

“I wished the teachers gave me more cases of cultural similarities and analyzed conflicts or advantages of differences between cultures.”

Then, 52.3% gave comments on the Communicating skill. Here are some examples:

“I need more conversational practice to share opinions in class.”

“The Thai teacher is good at English but did not always speak English in class, so we had less chance to develop our listening and speaking.”

“Teachers should explain more cross-cultural communication strategies and let us practice using those strategies inside and outside the classroom.”

“I wished the teachers let us listen, be familiar, and communicate with different accents of English users.”

Surprisingly, in the evaluation form, the participants rated a small amount of experience in performing Behavior skill (item 11). Nevertheless, only 23.8% of them raised their requirement on this aspect in the open-ended section as these following examples:

“I wanted to practice social manners with role-plays or simulations.”

“Using role-playing could make students have more understanding on the social actions.”

“The teachers should let us practice acting through role-plays or simulations to be familiar with the proper manner in an international context.”

The overview results in this open-ended section supported their rating scale scores. The participants mostly commented on the missing of Cultural self-knowledge, Withholding-judgment, and Respect towards Thai culture. These hindrances could impact the students’ misconception that learning other cultures is more important than knowing oneself. Later on, they may decline to conceive a sense of pride to express their national heritage to others and fail to achieve desirable characteristics of national citizens.

**SUMMARY AND CONCLUSION**

In summary, the English majors in this study evaluated themselves experiencing English intercultural learning to a moderate amount. The qualitative results were in accord with the quantitative results. The participants experienced learning Sociolinguistics, Universal cultural knowledge, and Openness attitude to a large amount when the teachers shared their experiences and viewpoints as cultural information and assigned discussion tasks in the classroom. However, they desired to see the significance of home culture, especially from the Thai English language teacher as
they noticed the absence of fostering respect, a sense of pride, and withholding judgment towards their home culture in the classroom. It was interesting that although the participants experienced Comparing & Analyzing, and Communicating skills to a large amount, they requested to learn more of these skills. They ultimately emphasized that they had insufficient performing role-playing tasks that offered them to practice listening and speaking English and familiarizing them with proper social behaviors in international communication.

In conclusion, the English intercultural learning experience of Thai learners remains indistinct status. Overlooking intercultural learning experience, which embedded in the life skills and learning skills, learners tend to lack IC, which effectively helps them become global-ready graduates and progress in careers in the 21st Century. English language teachers are the influencers who can inspire learners to aware of intercultural learning’s advantages and train them to make use of intercultural knowledge, attitudes, and skills to fulfill their livelihoods.

**Implications for Teaching and Research**

Providing learners with an English intercultural learning experience should proceed in no time. However, massive numbers of teachers remain uncertain about how to pass on this experience to learners. First, the teachers can facilitate learners to aware of sociolinguistics and cultural differences among their home country and others. The requirement is that the teachers should eliminate their own and learners’ cultural prejudice against home culture. Learners must value their own culture before being willing to learn about others. Then, cultivate learners to tolerate discrepancies between cultures through attitude-reinforcing tasks. Such tasks can be reflective writing, action logs, attitude expressions, discussions, or critical incidents that allow learners to compare and analyze similarities and differences between cultures from the world's perspectives to withhold their judgment and eliminate bias. The communicative and behavior skills can corporately use with comparing and analyzing skills in tasks like role plays, debates, interviews, or simulations. These tasks offer learners opportunities to perform appropriate social etiquettes as well as expressing meaningful English. A recurrent practice of the entire process, in the long run, facilitates learners to perceive, interpret, communicate, and relate information and messages to their own culture. In eventually, they know how to establish and retain the relationship among the world citizens. The researcher recommends future research to investigate the burdens of English intercultural teaching and learning in other levels to pinpoint the solutions and develop an English intercultural curriculum that meets the global need—globalization.

**REFERENCES**


Reading Difficulty and Development of Fluent Reading Skills: An Action Research

Osman Gedik
Niğde Ömer Halisdemir University

Hayati Akyol
Gazi University

Abstract

In this study, it was aimed to remediate the reading difficulties of a fifth-grade student having no physical or mental problem but experiencing reading difficulties and to develop his skills of reading fluency. For this purpose, the repeated reading, paired reading, and word repetition techniques were used in the research process. In addition, the meaning analysis, word map and vocabulary notebook techniques were also used due to the positive effect of rich vocabulary knowledge in remediating reading difficulties and improving skills of reading fluency. This study was designed as action research, one of the qualitative research designs, and it was carried out with a fifth-grade primary school student in Sivas in the spring term of 2018-2019. The Error Analysis Inventory was used to determine reading errors. In the case study to determine the levels of reading and comprehension, it was found that the participant was at the level of frustration in the fifth, fourth and third grade texts, and at the instructional level in the second-grade text. As a result of the reading, comprehension and vocabulary development activities, the student's reading motivation, desire and self-confidence increased, and he started to detect and correct reading aloud mistakes by himself. It was observed that the participant, who was at the second-grade instructional level at the beginning, reached the independent level in the text of the third grade and the instructional level in the text of the fourth grade at the end of the study lasted for 31 class hours.

Keywords: Reading Difficulty, Reading Fluency, Vocabulary Knowledge, Reading Levels, Paired Reading, Repetitive Reading.

DOI: 10.29329/ijpe.2022.426.2
1. INTRODUCTION

Human beings have been in the act of reading in order to understand the rapidly changing structure of society and to adapt to this structure, since the invention of writing to the present. Reading can be defined as the process of making sense in a regular environment in line with an appropriate method and purpose, based on effective communication between the author and the reader, with the cooperation of cognitive behaviours and psychomotor skills (Akyol, 2015; Razon, 1982). When the definitions are examined, we can define reading as the process of making sense in the mind by exposing the text and symbols to cognitive processes.

For reading, which is defined as the process of making sense from texts and symbols, to be effective, it must be handled as a fluent, sense-making, strategic, motivation-based, and lifelong process. The skills involved in this process constitute five basic principles of reading (Akyol, 2015). To be able to read effectively and at the expected level, individuals need to gain fluent reading skill, which is one of the fundamentals of reading skill (Ulusal Okuma Paneli [NPR], 2000). Fluent reading is the ability of the student to read the text at an appropriate speed, without pausing when he/she sees the sound, syllable, and word, as if he/she speaks in his/her daily life in an emotional and harmonious way (Akyol, 2016; Young & Rasinski, 2009). Based on the definition made, it is seen that the reading skills required for fluent reading to occur are accuracy, speed, and prosody. Accuracy refers to quick reading without making addition, subtraction and inversion mistakes in reading sounds, syllables, and words. Reading speed, according to Turna and Güldenoğlu (2019), involves automating the word recognition process and reading at the appropriate speed for the level. Automation occurs when the reader sounds the words in a text accurately and quickly, without much effort. We can define prosody as the ability to read through appropriate intonation and stress according to the sense of the text after achieving word recognition, perception, interpretation and reading speed, as the music of the spoken language (Akyol et al., 2014; Reutzel, 2009; Yıldırım & Ateş, 2011).

The two most important skills that affect fluent reading are word recognition and vocabulary knowledge. The inadequacy of these skills negatively affects the reading skills of the students compared to their peers. Inadequacies in reading skills cause students to fall behind in terms of achievement in both reading and other fields. Although they do not have any mental, auditory and visual problems, the concept used for students who fall behind their peers and have difficulty in reading due to insufficient socio-economic and educational opportunities is defined as learning disability. The Ministry of National Education defines these students as children who do not have interests, experiences for education and instruction due to the material and cultural inadequacy of their environment or who have special difficulties in understanding, explaining, reading, writing, drawing, recognizing, and conceptualizing due to organic and functional reasons, although they are not different from their peers in terms of level of intelligence (MEB, 2014). On the other hand, Akyol (2016) defines a poor reader as an individual who cannot transfer his/her prior knowledge to the reading environment during the reading process.

Today, the most important purpose of reading is to make sense of what is read. Two basic skills are needed in the process of sense-making: Recognition and perception. Recognition is the accurate and fast reading of letters, syllables, and words. Perception refers to making sense of the activity that is recognized by the senses in a reading material and continues to be processed by brain functions. Phonological awareness, analysis, and word recognition, which are the first steps of reading, must be at a sufficient level to make sense and read fluently which are two of the basic principles of effective reading. Word recognition is an important element in the reading process. Stanovich (2005) stated that word recognition is the most basic element of reading comprehension.

Individuals who experience problems with their fluent reading skills have some difficulties while reading a text. It has been observed that students with reading difficulties generally have some problems such as having short-term memory, not being able to concentrate their attention, being emotionally weak, reading without thinking, lack of eye-motor coordination, reading the words by turning them back, and having problems to divide the plot into stages. The problems that readers
encounter and the mistakes they make in word recognition are summarized by Akyol (2015) as inability to comprehend the relationship between symbol and sound, confusing words and letters, spelling difficulty, changing the position of letters in words, wrong reading, adding and subtracting, reading by inverting and repeating. When the literature on the elimination of word recognition mistakes and improving fluency in reading aloud is examined, it is seen that there are some methods and techniques used such as repeated reading (Akyol, 2016; Armbruster et al., 2010; Samuels, 1997; Therrien, 2004; Torgesen, 1986), paired reading (Akyol, 2016; Reutzel & Cooter, 2007; Topping, 1998), reader theatres (Akyol, 2016; Rasinski, 1999), word repetition technique (Chafouleas et al, 2004; Rosenberg, 1986), reading in choral (Akyol, 2016).

People communicate using their vocabulary knowledge to understand and explain something. Word can be defined as the label of feelings, thoughts and attitudes consisting of sounds or sound groups in such a way as to have a meaning or grammatical function and it can be used alone (Akyol, 2015; Ergin, 2013; Türkçe Sözlük, 2018; Yıldız, 2019). Another sub-dimension that constitutes the fluency of reading skill is vocabulary knowledge. Vocabulary has an important place among the factors that affect reading and writing, which are the basic language skills of comprehension and expression, and even the sub-language skills of listening and speaking (Karadağ, 2019; Karatay, 2007). Instead of vocabulary knowledge, other terms such as vocabulary repertoire, word level, word proficiency have been used in studies and definitions focused on vocabulary. Vocabulary knowledge is defined as the accumulation of words that the individual learns, understands, uses, and stores in memory as a result of his or her experiences (Akyol & Temur, 2007; Karadağ, 2019; Özbay & Melanioğlu, 2008).

Vocabulary knowledge affects the reading speed of students depending on their grade levels. A certain vocabulary of students is formed as a result of the texts structured within the framework of life studies, mathematics and Turkish main courses up to the fourth grade. At the fourth and higher grade levels, students who encounter with different words as a result of inclusion of new subject areas in the curriculum can maintain their level of success in reading by eliminating these deficiencies with vocabulary teaching activities. In vocabulary teaching, it is of great importance to determine which words to teach first. It has not been determined exactly which words will be taught to which age groups of children in schools and what the number of these words will be (Özbay & Melanioğlu, 2008). Students should have words, word groups, terms, idioms, proverbs, etc. to use when they employ their skills of understanding and expressing their own thoughts, feelings, desires and wishes in daily life in accordance with their age and level. At this point, traditional vocabulary tests, multiple choice measurement technique, yes-no questions and rubrics are some of the assessment techniques put forward by researchers to assess individuals' vocabulary knowledge (Akyol & Temur, 2007).

Vocabulary teaching should not be thought of as one-dimensional, just like teaching the meaning of a word with the use of a dictionary. The word to be taught becomes more permanent and concretized in the student's mind when taught in a sentence, through its antonym, synonym and near-synonyms etc. Different methods and techniques should be used in vocabulary teaching activities in accordance with students' age, level, grade level, interests and needs (Acat, 2008; Akyol, 2015). There are some methods and techniques to ensure the retention of words in the student's mind and to enhance vocabulary knowledge. These include dictionary usage, association, finger technique, grouping, direct vocabulary teaching, concept development, using clues in the sentence and text environment, finding the similar word, definitions, prior experiences, summarizing, reflection, word map, meaning analysis, vocabulary grouping, brainstorming, possible sentences, venn diagram, using visual materials, creating a dictionary book, choosing different meanings of words, teaching with games, producing words from the last letter of words, riddles, songs, using observations and experiences, producing new words from the root of the word, word-meaning matching, using proverbs and idioms, writing the word suitable for the dotted places in a sentence, puzzles, working with different text types, finding meaning from the sentence, word-visual matching, drama, word-related painting and speaking activities (Akyol, 2015; Akyol & Temur, 2007; Foil & Alber, 2002; Gardner, 2007; Gill, 2007; İnce, 2006; Montenegro, 2019; Rupley & Nichols, 2005; Özbay & Melanioğlu, 2008; Star, 2019).
1.1. Strategies Used in the Study

Individuals lose their self-confidence and experience learned helplessness in the face of jobs, areas or situations in which they have failed throughout their lives. Students with reading difficulties also experience acceptance and avoidance in the face of failure and create a fear of reading aloud (Anderson et al., 1985). Reading aloud allows the child to develop comprehension and vocabulary, gain ideas about sentence structure and ultimately professionalize in reading (Dickinson & Smith, 1994). The state of a student within the psychology defined in the first sentence of this paragraph should be determined for him/her not to be negatively affected in his/her future and an intervention program should be prepared including the appropriate methods and techniques for him/her to get rid of his/her problems.

In the current study, "Word Repetition Method", "Meaning Analysis", "Word Map" and "Vocabulary Notebook" techniques were used to increase the fluency in word reading. "Repeated Reading" and "Paired Reading" activities were carried out to improve fluency in text reading.

**Repeated Reading:** This type of reading refers to the poor reader’s reading the text repeatedly until gaining fluency. In repeated readings, the reader will become automatic in word recognition and read fluently after a while, as it is repeated until the reader's mistakes are corrected and can read at the expected speed with the help of a good reader. (Armbruster et al., 2001; Rasinski, 1989). It is an effective method for students to recognize and learn the words they encounter frequently. In this method, reading is started with texts suitable for the level of the poor reader and continued until the reader has achieved the success in reading expected in his/her grade level. Through repeated reading, students' reading skills are improved with texts that they have never encountered before, and contributions are made to their fluency by enriching their vocabulary. Activities are started on short texts suitable for the grade level determined for the participant on the basis of his/her performance. During reading, repeated reading activities are performed to correct sound, syllable and word reading mistakes. Misread words determined in the reading process are used in sentences and texts to try to eliminate the mistakes.

**Paired Reading:** It is a reading technique in which a teacher, a member of the family or a peer who reads well becomes a pair to the poor reader. In this technique, after a text has been selected, its title and visuals are discussed before reading. Then in the reading process the poor reader and the guide read the text aloud. When the poor reader pauses for four or five seconds during reading or makes mistakes, the guide immediately intervenes and gives feedback and then reading continues. The reading partner should adjust his/her reading speed considering the speed of poor reader and the feedback given should be positive and motivate the student to read. If the child wants to read on his/her own at some points during the reading process, he/she should be allowed (Akyol, 2016). In reading studies, reading is done with the researcher in order to eliminate reading mistakes in sounds, syllables and words that the participant has difficulty in pronouncing and to ensure fluency. The researcher and the participant try to eliminate reading mistakes by reading at the same time.

**Word Repetition Technique:** It is a technique used to eliminate word reading mistakes of students having reading difficulties. The word repetition technique covers the exercises to eliminate the mistakes by repeating the words that the student has read incorrectly during reading.

The teacher provides a text suitable for the level of the student. After the end of reading act, misread words are written on the cards. The student is asked to read the words written on the cards. The word written on the card must be read correctly within five seconds. If the student cannot read the word shown within five seconds, it is considered to be misread. Each misread word is pronounced correctly by the teacher and then the student is asked to read that word again. The student reads the word and repeats it many times. Each corrected word is removed to be read later by the student. The word card that is read incorrectly is shown repeatedly. The misread word is read by the student until the student reads the word with its correct pronunciation. All words written on the cards are collected.
and shown to the student again. This process continues until the student does not make a mistake on two consecutive cards (Jenkins & Larson, 1979; Yılmaz, 2008). The word repetition technique is an effective method for poor readers to enhance their word recognition skills and vocabulary knowledge.

**Word Map:** The word map method is a method that can be used from the fourth grade onwards to enhance vocabulary knowledge. The word map is a preferred word teaching strategy to show how the words to be taught relate to other words in a particular order (Searfoss, Readene & Mallette, 2001; Yıldız, 2019). When using the method, three basic questions should be answered (Akyol, 2016):

1. What is the definition of the word and concept?
2. What does it resemble to?
3. What are its examples?

In this method, the key word should be determined while the teacher is reading the text related to the theme in which the word or concept to be taught, or the words that the students have difficulty, do not know or express incorrectly should be studied. The misread words recognized during the reading activities performed on the texts suitable for the reading level of the student or the words whose meanings the reader is understood to not know from his/her questions such as "What is the meaning of this word?" are the targets of vocabulary activities. The determined words are noted by the researcher and a word map is designed by placing a picture of the word on a worksheet. By having the participant interpret and discover the picture of the word on the worksheet and by examining the meaning of the picture, its lexical meaning, examples and various dimensions, it is attempted to create a scheme of the word in the participant's mind.

**Meaning Analysis:** It is a technique developed to enhance vocabulary knowledge and to increase reading comprehension. In the literature, it is addressed under different names such as meaning analysis, feature analysis, semantic feature analysis. It is an effective technique especially for poor readers and students with learning difficulties (Gunning, 2006; as cited in Akyol, 2015). With the meaning analysis strategy, students focus on the basic properties of words. Meaning analysis contributes to the development of classification and analysis skills of students while helping them learn the properties of different words and concepts comparatively. It also improves students' verbal-linguistic, logical-mathematical, visual-spatial and interpersonal intelligence (Yıldız, 2019). Based on students' prior knowledge, it helps them to learn the meaning of new concepts and words they encounter. Reading errors or words that the participant does not know the meaning of are determined in the reading studies and the meaning clusters including these words are created. A table is created by determining whether the words have some properties or not, by writing the searched properties of the words in each column and the words to be analyzed in each line. Words that can be easily and concretely classified within the framework of the subject and theme should be chosen. After the table has been created, the semantic features of the world are determined by asking questions to the student. One “+” should be given for each feature that word has, one “−” should be given for each feature the word does not have and “?” should be put for each feature which cannot be decided whether the word has or not and they should be discussed (Akyol, 2015; Marzano, 2013; Yıldız, 2019). The table can be extended if the next text to be read will be relevant to it.

**Vocabulary Notebook:** The vocabulary notebook technique is like the student's word memory in vocabulary teaching. The student can write new words with its different meanings and uses in this notebook, which increases retention. In the literature, this technique has been called under different names such as vocabulary notebook, dictionary notebook and word notebook. Vocabulary notebooks aim to deepen the knowledge of students about the word they do not know and to increase their vocabulary knowledge by recording the various meanings of the words on the notebook (Marzano, 2013; Yıldız, 2019). It is a vocabulary teaching technique in which a notebook is formed from the words which the student does not know or the keywords extracted from texts on the basis of the
themes or topics covered during reading. Three or five words should be studied in a class hour. Studies have revealed that vocabulary teaching activities that are done by creating a vocabulary notebook have a positive effect on students’ vocabulary and academic achievement (Marzano, 2006).

Before working with the word notebook technique, a notebook is determined or worksheets are designed for the participant to use, and then these are collected and turned into a notebook. The notebook is divided into sections in alphabetical order. A new word is written in the related section of the notebook according to the first letter of the word to be examined. The dictionary meaning of the word is found and written. Then, its synonyms and antonyms can be determined and their meanings are written as well. Two sentences (it can be increased according to the understanding of the student) containing the real, connotational, metaphorical, synonymous or opposite meanings of the word are written down in the notebook.

The development of reading and comprehension skills has a very important place in terms of individuals’ carrying healthy communications with the society in which they live, fostering their own personal development and continuing their daily life. Before individuals start their formal education, they engage in the act of environmental reading in their daily lives. Deducing the meaning of the sales signs of the products in the markets and from the traffic signs on the streets is a kind of act of reading and comprehending. The success of students starting formal education in reading activities affects their overall academic success. Accurate and fluent reading and reading comprehension will positively affect students’ academic achievement not only in Turkish lessons and activities, but also in other subject lessons.

The skill of reading has been among the most basic needs and indispensables of human beings since their existence, and the advancement in basic language skills has shown its positive effect in every moment and area of individuals' lives (Akyol, 2016; Akyol, 2019; Bıyık & Erdoğan, 2017; Çaycı & Demir, 2006). However, it is a fact that there are students who have difficulty or fall behind in reading. Early diagnosis of these students who have reading problems and interventions for these students are very important (Balcı, 2017; Hurford et al., 1994; Schatschneider & Torgesen, 2004). In this context, educational and instructional activities for students who have reading difficulties can be planned to reduce or eliminate their problems in reading. However, in our country, it is seen that there is limited research for the in-depth investigation of students who have reading difficulties or fall behind. The current study is considered important in terms of guiding researchers, teachers and parents in reducing and eliminating the problems experienced by students who have reading difficulties although they do not have any visual, auditory or mental disabilities, and in developing their reading skills.

2. METHOD

2.1. Research Model

In this study, action research model, one of the qualitative research designs, was used. Action research includes the working of practitioners on their own or with a researcher to understand and solve the problems that emerge in the application process. It is an approach that combines research and practice and facilitates the transfer of research results into practice (Yıldırım & Şimşek, 2016). Applied action research is designed by teachers to find a solution to a problem they encounter in their classrooms, to improve the learning level of students in any subject and to increase their own professional performance (Creswell, 2013).

2.2. Characteristics of the Participant

Within the context of the current study, the code name Sefa was used to keep the actual identity of the participant confidential. It was determined that Sefa did not have any disability in the state hospital, where hearing and vision tests were applied to him. In addition, as a result of the
evaluations and observations made by two special education experts separately, it was determined that Sefa did not have any mental problem.

Sefa, who is a fifth-grade primary school student, is attending a primary school in Sivas. Sefa's father works in the private sector and his mother is a housewife. The mother and father are divorced and live in other cities. Sefa is living with his mother, grandfather and grandmother. His mother stated that Sefa had difficulty in doing his homework and therefore he did not like to do homework. Although he was not cognitively deficient, it was observed that he was distracted quickly during homework and study hours. During the activities, a great care was taken to keep the room door and window closed in order not to distract the participant, and that there were no distracting tools and devices on the table where the activities were performed. Behaviourally, observations of his parents and teachers were used. The participant has a calm and easy-going social personality. It was seen that he started and maintained communication. It was observed that the participant, who was observed in the classroom for one class-hour, listened to the lesson but did not much participate orally. It was observed that he did the tasks assigned by the teacher.

It was observed that the participant did not have any difficulties in the pronunciation of the sounds and the recognition of the letters, but he made mistakes by adding-subtracting sounds or syllables to/from the words he read and he could not attain the proper sitting position as he bended too much over the book while reading. In addition, it was observed that the participant made word recognition mistakes as he read the texts too quickly and answered the questions about the text incorrectly. Since the reading speed is related to the speed of thinking, it was decided to apply the meaning analysis, word map and vocabulary notebook methods among the word teaching methods for the participant. The texts in which very interesting, easy and concrete topics are covered were used to improve reading fluency and comprehension skills.

2.3. Study Environment

The study was generally carried out in the living room of the participant's home one hour after leaving school on weekdays. As the study environment was his own home, he did not experience any adaptation problems. The participant has a moderate socio-economic home and study environment. A great care was taken not to leave any distracting items and materials on the table where the reading activities were carried out, and the student was allowed to have his favourite things (such as pencil, eraser, tripod) to provide the motivation. Since the student did not have a physiological problem and discomfort, it was ensured that the student was comfortable during reading by using the fabric upholstered chair he used at his study desk. During the study process, a sensitive attitude was displayed by being in constant interaction with the parents towards their opinions, requests and demands. It was observed that the communication carried with the parents had a positive contribution to the learning-teaching environment and process.

2.4. Data Collection Tools

In the current study, the "Phonological Awareness Evaluation Form" was used to evaluate the readiness of the participant and to determine and improve his reading and writing level, the reading texts and the audio video recordings were used to have a qualified evaluation during the reading of the texts, and “Mistake Analysis Inventory” was used to make an evaluation before, during and after the reading activities.

Reading Texts: They are texts selected from Turkish textbooks and used in the reading process. For the participant who is a fifth-grade student, the level was determined with the texts selected from each grade level. Taking into account the reading level, the texts used in the study process were determined not to be above the student's level.

Phonological Awareness Evaluation Form: Before starting the reading activities with the participant on word recognition, the "Phonological Awareness Evaluation Form" (Delican, 2018),
which is one of the activities to evaluate phonological awareness skill, was used. This form aiming to evaluate phonological awareness consists of fourteen sub-tests: "finding rhymed words", "finding words starting with the same sound", "noticing rhymed lines", "knowing and deleting the last sound of the word", "knowing and changing the last sound of the word", “knowing and deleting the first sound of the word”, “knowing and changing the first sound of the word”, "producing word in compliance with the sound", “word combination", "word separation", "syllable combination", "syllable separation", "phoneme combination" and "phoneme separation". A scoring table was created for each test and the success status was determined by writing the value "1" for correct answers, "0" for incorrect answers.

Audio Video Recordings: Before starting the reading activities of the participant, a video recording of the application of each technique used in the reading process was made; audio video recordings were made to make an interim evaluation in the middle of the reading process and to make a final evaluation at the end of the reading process. Video shooting is important in terms of both a qualified evaluation and contributing to the participant and teacher to visibly follow the change in the reading level.

Mistake Analysis Inventory: The Mistake Analysis Inventory, which is one of the various activities to determine and evaluate the situation related to reading, consists of the word comprehension and percentage determination guide adapted by Akyol (2016) drawing on Ekwall and Shanker (1988), Haris and Sipay (1990) and May (1986). The inventory consists of four parts: mistake types and symbols, word recognition level and percentage determination guide, question scale and table of comprehension levels. With this inventory, three types of reading levels are identified.

1. Independent Level: It refers to the student's reading and understanding texts appropriate to his/her level without any help.

2. Instructional Level: It refers to the child's reading and understanding as desired with the support of a teacher or an adult.

3. Frustration Level: It refers to the level at which the child understands very little of what he/she reads and/or makes many reading mistakes.

We can express the above reading levels in percentages as follows: Those whose word recognition level is at least 99% and comprehension level is 90% and above are at the independent level, word recognition level is between 90% and 99% and comprehension level is between 51% and 89% are at the instructional level and word recognition level is 90% and below and comprehension level is 50% and below are at the frustration level.

Vocabulary Teaching Activities: These are activities performed on words whose meaning is unknown in the texts used during reading studies with the student. In the vocabulary teaching activities, words whose meaning was unknown were studied with the vocabulary notebook after reading. Some words whose meaning remained unknown within the context of the vocabulary activity were examined with the meaning analysis table and word map worksheets created by the researcher in the next lesson.

2.5. Stages of the Study

In this section, activities were carried out to determine the reading and comprehension level of the participant. Although the participant was a fifth-grade student, it was found that he was at the second grade reading and comprehension level in the pre-test study. After the permission was taken from the parents, the student was taken to a state hospital for vision and hearing tests and it was determined that he had no impairment. Two experts in the field of special education confirmed that there was no mental problem of the student.
It was observed that Sefa made many mistakes of adding and subtracting during reading. It was observed that he mostly added/subtracted sounds or syllables to/from words he had difficulty recognizing. Sefa, who did not read fluently, read without stress and intonation and paying attention to punctuation marks. He read very fast and gave wrong or “I don't remember” answers to the questions asked to determine his level of comprehension.

2.5.1. Determination of Phonological Awareness

The phonological awareness form of the literacy readiness evaluation tool developed by Delican (2018) to determine Sefa's phonological awareness was applied. In the form, fourteen sub-tests were administered to the participant in one class hour (40 minutes). For the participant not to be affected during the application, correct answers were coded with "A" and wrong answers with "B". The score to be taken from the form consisting of fourteen sub-tests is 209. The participant took 159 from the administration of the form. It was seen that he took low scores from the following sub-tests: “finding rhymed words”, “knowing and deleting the last sound of the word”, “knowing and changing the last sound of the word”, “phoneme combination” and “phoneme separation”.

2.5.2. Determination of the Reading Level

In order to determine the reading level of Sefa, the texts were used in the pre-test process, starting from the text suitable for his own grade level and down to the first-grade level. Two class hours (80 minutes) application was conducted to determine the reading level. Sefa was first given a text called "Anadolu Atasözlerinde Özleşir” consisting of 312 words in his own grade level, fifth grade Turkish textbook. He made a reading mistake in 72 words in total, and 69 of these mistakes were adding/subtracting sounds or syllables to/from the word, and 3 of them were skipping and passing, and he read this text in 5 minutes and 45 seconds. According to the mistake analysis inventory, he was considered to be unsuccessful because the reading success was below 91%. Thus, the reading level of the student was found to be the frustration level.

Sefa was then given a text "Gizemli Canlılar” consisting of 173 words in the fourth-grade Turkish textbook and made a reading mistake in 32 words in total. All these mistakes are mistakes of adding/subtracting sounds and syllables to/from the word. In addition, the reader read this text in 2 minutes and 5 seconds. According to the mistake analysis inventory, he was considered to be unsuccessful because the reading success was below 91%. In this case, the reading level of the student was found to be at the frustration level.

Sefa was then given a text called "Çocuk Memur" consisting of 203 words in the third-grade Turkish textbook and made a reading mistake in 43 words in total. Forty of these errors were determined as adding/subtracting sounds or syllables to/from the word, 2 reversing and 1 skipping and the reader completed the text in 3 minutes and 5 seconds. He was considered to be unsuccessful because it was found to be below 91% according to the mistake analysis inventory. Thus, the reading level of the student was found to be at the frustration level.

Finally, Sefa was given a text called "Efe Tiyatroya Gidiyor" consisting of 120 words in the second-grade Turkish textbook and made a reading mistake in 7 words in total. Six of these mistakes were determined to be adding/subtracting sounds or syllables to/from the word and 1 skipping and he read the text in 1 minute and 45 seconds. Word recognition percentage was found to be 94% according to the mistake analysis inventory. Thus, the reading level of the student was found to be at the instructional level.

2.5.3. Determination of the Level of Comprehension

In order to determine the comprehension level of Sefa, five questions were created for each text used as a pre-test in the reading process. The first three of these questions are about the literal comprehension, and the last two questions are about the deep comprehension. The comprehension
level was determined as 24% according to his answers to the questions created from the text at the fifth-grade level, 50% according to his answers to the questions created from the text at the fourth-grade level, and 32% according to his answers to the questions created from the text at the third-grade level. According to the mistake analysis inventory, percentages of 50% and below indicate that the reader's level of comprehension is the frustration level.

The level of comprehension was determined as 67% according to his answers to the questions created from the text at the second-grade level. The percentages of comprehension between 51 and 75% according to the mistake analysis inventory show that the reader's comprehension level is the instructional level.

2.6. Application Process for Remediation of Reading and Comprehension Mistakes

In the current study, in order to ensure that Sefa is ready to read and relaxed, a conversation was started about the issues from his daily life. During the conversation, he was asked questions such as “Do you like reading”, “Why do you like reading?”, “Which subjects do you like reading about?”, “Are there books you like and wonder about?”, “Do you want to read as your friends do?”, “Why do you read very fast?”. In order for Sefa to have confidence in the researcher, the researcher tried to get to know Sefa closely and talked about himself. During the study, the researcher tried to motivate the participant and increase his motivation by saying that he will help him, give the chance to read again when he makes a mistake, and that they will perform reading together by using different techniques in order for his reading to be successful and for him to gain fluency.

The study was started in the spring semester of the 2018-2019 academic year and planned to be 9x40 class hours per week, one class hour (40 minutes) on Mondays, Tuesdays, Wednesdays, Thursdays and Fridays each and two class hours on Saturdays and Sundays. An action process was planned covering 31 class hours and 15 hours of these 31 class hours were allocated to the application of fluent reading methods and the other 16 hours to the application of phonological awareness and vocabulary techniques.

2.6.1. Applications to Remediate Reading Mistakes

At the beginning of the reading studies, activities were planned to improve the student in the following areas of phonological awareness where he was found to be weak in the phonological awareness sub-tests: "phoneme separation", "phoneme combination", "knowing and deleting the last sound of the word", "knowing and changing the last sound of the word" and "finding rhymed words". Similar activities were designed and applied by the researchers for the phonological awareness subtests before all the reading activities.

Reading studies were started with the reading texts at the instructional level of the student. Repeated and paired reading activities were carried out, selected among the fluent reading techniques determined before. In the repeated and paired reading activities, the text was first read by the researcher. Then the researcher and the student read the text together. Finally, the student read the text aloud three or four times individually, depending on his reading success. As a result of the pre-test, it was observed that the student made mistakes by adding or subtracting syllables to/from words. During the reading activities, the words that were read incorrectly were detected and it was planned to do word recognition exercises by using the word repetition technique. While the student was reading the text, the researcher detected the mistakes made on the same text he had in front. After reading by using the repeated and paired reading techniques, the words where the student made reading mistakes were written on 5x10cm cards by the researcher and shown to the student. This practice was repeated until the student did not make a mistake in reading.
2.6.1. Applications to RemEDIATE Comprehension Mistakes

After the reading activities, it was observed that vocabulary knowledge contributed to word recognition and discrimination, and also to the meaning of the text read. Therefore, it is aimed to improve the participant’s reading aloud level, reduce reading errors and increase comprehension level by using word map, meaning analysis and vocabulary notebook techniques, answering the questions prepared about the texts read in the other 16 hours of class time.

During the reading activities, the words whose meanings were unknown to the student were detected. These words were examined in the vocabulary notebook by the researcher and the student together. With the vocabulary notebook, the student learned the definition of the unknown word, its usage in sentences, synonyms and antonyms by writing them in the vocabulary notebook. Some words were examined in the next lesson by using the meaning analysis table and word map worksheets prepared by the researcher. With the meaning analysis table, teaching of more words was achieved by examining the unknown word together with other words which were in the same meaning set. Teaching of the unknown word was carried out with the word map activity by examining the definition, features and examples of the word.

At the end of the thirty one class hour period, the texts that had been used in the pre-test were used again in the post-test, and the reading and comprehension levels of the participant after the study were assessed by applying the mistake analysis inventory.

3. FINDINGS

3.1. Assessment of the Reading Level

In order to assess the reading level of Sefa, a text suitable for his class level was given to him to read before starting the study. The texts at the lower grade levels were given to him to read until he reached the instructional level success determined according to the mistake analysis inventory and the pre-test studies were carried out by determining the texts up to the second-grade level where the instructional level success was achieved. Mistakes made by Sefa were detected in the reading level assessment activities and then some activities were conducted to remediate these reading mistakes within the action plan. After the completion of the action plan, a post-test evaluation was made with the same texts to assess reading success. As the continuation of lesson delivery process in the action plan conducted to assess the reading level, 2 class hours (80 minutes) were allocated to the evaluation of the reading success following the studies conducted with Sefa to increase his reading interest and motivation.

Table 1. Results of the pre-test and post-test conducted to determine the reading level according to the Mistake Analysis Inventory.

<table>
<thead>
<tr>
<th>Text Level</th>
<th>The Number of the Words in the Text</th>
<th>Type of the Test</th>
<th>Type of the Mistake</th>
<th>The Number of the Mistakes</th>
<th>The Total Number of the Mistakes</th>
<th>Word Recognition Percentage</th>
<th>Time for Reading</th>
<th>Reading Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Grade</td>
<td>120</td>
<td>Pre-test</td>
<td>Adding/Subtracting</td>
<td>6</td>
<td>6</td>
<td>94</td>
<td>105 seconds</td>
<td>Instructional Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skipping</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Misreading</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reversing</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-test</td>
<td>Adding/Subtracting</td>
<td>1</td>
<td>1</td>
<td>99%</td>
<td>81 seconds</td>
<td>Independent Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skipping</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Misreading</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reversing</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade</td>
<td>Pre-test</td>
<td>Adding/Subtracting</td>
<td>Skipping</td>
<td>Misreading</td>
<td>Reversing</td>
<td>Post-test</td>
<td>Adding/Subtracting</td>
<td>Skipping</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>--------------------</td>
<td>----------</td>
<td>------------</td>
<td>-----------</td>
<td>-----------</td>
<td>--------------------</td>
<td>----------</td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td>40</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td></td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td>32</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td>69</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td></td>
<td>37</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 1 is examined, it is seen that Sefa's reading level is at the frustration in the text of the fifth grade, which is his own grade level, in both the pre-test and post-test results. However, when the table is examined, it is seen that between the pre-test and the post-test, his reading mistakes decreased by 50 percent, the time to read the text decreased and the percentage of word recognition increased.

When the pre-test and post-test results for the text of the fourth grade were examined, it was found that as a result of the activities conducted to increase the reading and vocabulary knowledge of Sefa, when his reading level was at the frustration level, he achieved a success rate of 100% by making reading errors in 6 words in total in the same text consisting of 173 words, and his word recognition level was found to be 97%. Using the mistake analysis inventory, it was observed that Sefa reached the instructional level in the text of the fourth grade, according to this success percentage.

When the activities conducted within the context of the pre-test and the action plan process and the results of the post-test were examined, it was seen that Sefa reduced reading mistakes day by day and remediated the problems in word recognition to a great extent. In addition, while he had a slow reading speed at the beginning, the increase in the speed of word recognition after the action study and the decrease in his mistakes decreased his reading time of the texts and became an indication that he improved his reading skills. As a result of the investigation of the video recordings by the researchers, it was understood that Sefa read by paying attention to the stress and intonation and pauses during the reading activities and reading of the final evaluation texts, which is an indication that his prosodic reading skill also developed.

According to the results of the pre-test conducted to determine the reading level, Sefa was found to be at the instructional level in the second-grade text yet at the end of the reading activities, he increased his word recognition level to 99% by making a reading error in a total of 1 word in the same text consisting of 120 words. In addition, when Table 1 is examined, it is seen that according to the results of the post-test obtained for the text of the third-grade level Sefa's reading success reached the instructional level as a result of the activities conducted to improve his reading and vocabulary. According to the mistake analysis inventory, this success shows that Sefa reached the level of independent reading in the second-grade text and reached the instructional level in the third-grade text and thus in the further reading studies to be conducted with Sefa, the process can be started with third grade texts.
3.2. Assessment of Comprehension Level

In order to assess the comprehension level of Sefa, exactly the same texts used in the pre-test process were used in the post-test evaluation and five questions were asked again after reading for each text created. The first three of these questions are about the literal comprehension, and the last two questions are about the deep comprehension.

Table 2. Results of the pre-test and post-test conducted to determine the comprehension level according to the mistake analysis inventory.

<table>
<thead>
<tr>
<th>Text Level</th>
<th>Type of the Test</th>
<th>Type of the Question</th>
<th>The Number of the Questions</th>
<th>Point to be Taken</th>
<th>Point Taken</th>
<th>Comprehension Percentage</th>
<th>Comprehension Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Grade</td>
<td>Pre-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>67%</td>
<td>Instructional Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>100%</td>
<td>Independent Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Grade</td>
<td>Pre-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>32%</td>
<td>Frustration Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>100%</td>
<td>Independent Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th Grade</td>
<td>Pre-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>50%</td>
<td>Frustration Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>84%</td>
<td>Instructional Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th Grade</td>
<td>Pre-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>25%</td>
<td>Frustration Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Literal Comprehension</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>17%</td>
<td>Frustration Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep Comprehension</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sefa made too many word reading mistakes as seen in Table 1 while reading the text at his own grade level during the post-test evaluation process. When table 2 is examined, it is seen that he gave either no answers or incomplete answers to the literal and deep comprehension questions during both the pre-test and post-test evaluation processes. Then, in the pre-test results, Sefa was found to give not adequate answers to the comprehension questions in the third and fourth grade texts and he was found to be at the frustration level as his percentage of comprehension was found to be 50% and below.

As can be seen in Table 2, since he was found to have a level of comprehension above 50% in the second-grade level text questions, comprehension studies were started with second grade text. Unknown words were identified during each reading activity. After the completion of the reading study, vocabulary activities focused on the unknown words and key words in the text to be read next were conducted. The unknown words were addressed and the activities conducted on the basis of the comprehension questions after each reading text increased the comprehension scores and success of Sefa as can be seen in Table 2.
The text determined for the fourth-grade level in the pre-test evaluation was also used in the post-test evaluation. When the answers given by Sefa to three literal questions and two deep comprehension questions were analysed by using the mistake analysis inventory, the comprehension level was found to be 84%. The scores taken by Sefa from the answers he gave to the questions on the texts revealed that his comprehension level reached the level expected at the fourth-grade level. As a result of the comprehension studies, it was seen that his success reached the instructional level in fourth grade text.

4. DISCUSSION AND RESULTS

"Phonological Awareness Evaluation Form" and "Word Repetition Method" were used to remediate the reading difficulties of an elementary school fifth grade student. "Repeated Reading" and "Paired Reading" activities were carried out for the student to gain fluency in the reading process. In addition, since the development of vocabulary will contribute to fluent reading, "Meaning Analysis", "Word Map" and "Vocabulary Notebook" techniques were used. An action process was planned covering 31 class hours and 15 hours of these 31 class hours were allocated to the application of fluent reading methods and the other 16 hours to the application of phonological awareness and vocabulary techniques. As a result of the study, which was started with the 5th grade texts, followed by 4th, 3rd, 2nd and 1st grade level texts, the student reached the fourth-grade instructional level from the second-grade instructional level.

Repeated and paired reading activities were conducted to improve the student’s reading speed and prosody. In a study conducted by Therrien (2004) to investigate the effect of repetitive reading on fluent reading and comprehension, repeated reading activities were carried out with students who have reading difficulties despite not having a mental disability, to improve fluent reading and comprehension on a particular text. After reading, he asked the students questions about the reading text. As a result of the study, it was found that the students read fluently and gave correct answers to the questions. Roundy and Roundy (2009), in their study investigating the effect of repeated reading on the development of fluent reading, found that the repeated reading strategy increased the students' reading speed. Many studies have been conducted using repeated reading which is one of the oldest and the most effective methods (Akyol & Çetinkaya, 2009; Akyol & Kethenolay Kayabaşı, 2018; Carver & Hoffman, 1981; Gonzales & Elijah, 1975; O’Shea, Sinder & O’Shea, 1987; Özkar, 2010; Weinstein, 2004; Yıldız, 2013; Yılmaz, 2008). The findings reported by these studies concur with the finding of the current study.

To minimize word recognition and reading mistakes, the mistakes made by the student in each reading activity were detected by the teacher and tried to be remediated with the word repetition technique. The student, who was found to have made 32 reading mistakes in the fourth-grade text consisted of 173 words in the pre-test evaluation, reached the instructional level from the frustration level by making a reading error in 6 words in the same text at the end of the study. Yılmaz (2008) investigated the effect of the word repetition technique on correcting the student’s reading mistakes and ensuring fluent reading in the study conducted on an 8th grade student. As a result of the study lasting for two and half months, the student who was found to be at the fifth-grade frustration level at the beginning of the study reached the fifth-grade independent level and seventh-grade instructional level at the end of the study. It has been seen that the studies conducted by Jenkins and Larson (1979) and Rosenberg (1986) on correcting reading errors and developing fluent reading skills of the word repetition technique have achieved a successful result.

After the fluent reading activities, three literal and two deep comprehension questions for each reading text were used to assess and improve the student’s comprehension level. In the pre-test evaluation, the student’s comprehension level was found to be at the second-grade level yet in the post-test evaluation, his comprehension level was found to be at fourth-grade level. Students’ having many mistakes in word recognition and fluent reading negatively affects their comprehension level. Studies support the fact that students’ fluent reading problems negatively affect their reading comprehension level (Akyol & Baştug, 2015; Anema, 2008; Başaran, 2013; Hixson & McGlinchey,
There is a positive correlation between vocabulary knowledge and reading success. In other words, the richness of the reader's vocabulary has a positive effect on shortening the time spent on word recognition or focusing while reading a text. In the current study “Phonological Awareness Method” was used to increase syllable and word awareness; “Meaning Analysis Technique” was used to make the student better recognize different aspects of a word and “Word Map Method” was used to increase the retention by means of visuals. Establishing connections between the meaning of a word and visuals helps to encode the word in the mind (Sadoski, 2005). With "Vocabulary Notebook Method", activities were carried out to reduce the word recognition mistakes by introducing the student to different usages and meanings of the word because for the word to be completely formed in the mind, all the meanings of the word must be internalized by the student (Acat, 2008; Göçer, 2009). In the study, it was seen that word teaching methods contributed to word recognition and fluent reading because during the reading activities, it was observed that when the unknown words or the words in which the student made mistakes were studied, the student was able to read them correctly in the next text and this positively affected his answers to the comprehension questions.

In light of the findings of the current study, it can be suggested that teachers should not forget that fluent reading is an important component of reading comprehension, that they should conduct activities to develop fluent reading in their classrooms and that they should use fluent reading skills to measure and evaluate reading and comprehension. Researchers on the other hand can conduct similar studies on different grade levels through loud and silent reading activities and by diversifying the texts to be used.

Teachers and specialists of reading should remember that word recognition and fluency are important in reading comprehension, and vocabulary knowledge greatly affects reading and reading comprehension. Similar studies can be conducted on different grade levels.

5. REFERENCES


Yıldız, M. (2013). Okuma motivasyonu, akıcı okuma ve okuduğunun anlamanın beşinci sınıf öğrencilerinin akademik başarılardaki rolü. Turkish Studies - International Periodical For The Languages, Literature and History of Turkish or Turkic, 8(4), 1461-1478.


Investigation of the Correlation Between Self-Esteem and Coping Strategies of Students Attending Secondary School

Esin Özer
Aydın Adnan Menderes University

Hamdi Korkman
Afyon Kocatepe University

Abstract

The aim of this research is to explore the relationship between self-esteem in secondary school students and coping strategies. This study was carried out with 523 participants from the 6th, 7th and 8th grades of two secondary schools in Aydın. The 292 participants were female students and 230 male students. Of the applicants, 157 are in 6th grade, 238 are in 7th grade and 127 are students in 8th grade. The Coping Scale for Adolescents (Kidcope) and the Coopersmith Self-Esteem Scale were used as a data collection tool. The Pearson Moments Multiplication Correlation Coefficient Technique was used to evaluate the relationship between (Kidcope) CSA scores and the total Coopersmith Self-Esteem Scale score. Multiple regression analysis has tested the predictive intensity of dealing with self-esteem. It has been determined, according to the results, that there is a significant and positive relationship between self-esteem and strategies for coping.

Keywords: Self-Esteem, Coping Strategies, Secondary School Students.

DOI: 10.29329/ijpe.2022.426.3

---

Esin Özer, Assist. Prof. Dr., Department of Education, Aydın Adnan Menderes University, ORCID: 0000-0002-1896-7362

Correspondence: eozer@adu.edu.tr

Hamdi Korkman, Assoc. Prof. Dr., Department of Social Work, Afyon Kocatepe University, ORCID: 0000-0001-6025-9696
INTRODUCTION

One of the most important developmental stages in people's lives is adolescence, which takes place between childhood and adulthood (Shullman & Ben-Artzi, 2003). Adolescence is a period in which a young individual experiences many biological, psychological, social changes and developments. Adolescents constitute an important group, especially in preventive mental health studies, since it is a transition period between childhood and adulthood in which brand-new adaptations occur (Yavuzer, 2005). Adolescence is an important critical period in the development of the individual and the transition from childhood to adulthood in which the individual becomes independent, creates new relationships, develops social skills, and learns behaviors that extend to the rest of their lives.

Self-esteem plays a very important role in adolescence period. Self-esteem is closely related to the definition of mental, mental health and life goals. The formation and development of self-esteem constitutes the adolescent and its relationship with the world around it, its competence and the quality of the activities shown (Minev, Petrova, Mineva, Petkova & Strebkova, 2018).

Self-esteem, which is defined as an individual's self-worth, belief that he is competent and equipped to achieve his goals, and is not only related to academic success but also to conditions such as life satisfaction and happiness (Taku & McDiarmid, 2015). Self-esteem is part of our personality and is a personal sensitivity that comes from our achievements in situations where we challenging life (Minev, Petrova, Mineva, Petkova & Strebkova, 2018). Individuals with high self-esteem are individuals who make every effort to be happy, healthy, productive and successful, who do not hesitate to do more challenging activities, act more determined and more determined to cope with the difficulties they encounter, and show a positive attitude towards themselves (Coleman and Hendry, 1999). High self-esteem in adolescents attracts attention with its aspect that leads to psychological well-being, better social relationships, higher academic success and decreases the occurrence of emotional problems. In addition, self-esteem is a motivating factor in adolescents' search and practices for self-realization (Petrulye, 2019).

Physical and social changes that occur during adolescence cause fluctuations in self-esteem and low self-esteem affects adolescents' susceptibility to depressive states. Low self-esteem is not only a disturbing emotion, but also plays a role in the emergence of psychopathological conditions ranging from anxiety to psychosis (Masselink, 2018). Individuals with low self-esteem are anxious, pessimistic, have a negative perspective about the future, and expect failure, attributing more worthlessness and inadequacy to themselves when they fail (Balat & Akman, 2004). Individuals with low self-esteem are individuals who are suspicious of their own abilities, sensitive to failure, and who experience intense burnout (Orth, 2016). Individuals with low self-esteem have difficulties in accepting praise and criticism, give up their job at the slightest disappointment, avoid making new experiments, and are highly affected by negative peer behaviors towards themselves (Yavuzer, 2000).

Low self-esteem is considered a risk factor. When the individual does not “position” himself as valuable, he or she faces many problems such as addiction, eating disorder, unhealthy relationship problems, poor communication skills, negative thinking, failure at school and work, and inability to use coping skills effectively. Therefore, enhancing low self-esteem leads to positive results such as increasing psychological well-being and producing desired changes in human behavior (Leary, 1996).

The crucial role of self-esteem continues to attract the attention of researchers. In some studies, self-esteem was found to be associated with self-efficacy (Güler & Bedel, 2018), computer addiction (Aydıner, 2017), life satisfaction (Akcan, 2018), social skill level and locus of control (Çutuk, 2017), parent attitudes (Gürler, 2017), hopelessness (Karataş & Çakar, 2011), perceived social support (Bedel & Kutlu, 2018), psychological resilience (Sarıkaya, 2015), psychological well-being (Çelenk & Peker, 2020), social emotional health and empathy (Petrulye, Guogiene, and Rimiene, 2019).
The use of active coping strategy, which draws attention as a characteristic of individuals with high self-esteem, includes defining the problem, thinking about solution options, applying and evaluating, brings highly effective and functional results for the individual. It is assumed that effective coping evokes high self-esteem caused by high-quality psychological responses triggered by behavior (Bednar, 1989). The characteristics of individuals with high self-esteem, such as making every effort to be happy, healthy, productive and successful, not hesitating to do more challenging activities, and being able to cope with the difficulties they encounter more decisively (Coleman & Hendry, 1999), also in individuals with developed coping strategies. It draws attention as they are the features encountered.

Individuals are faced with problems of different nature in many areas of life, including school. Coping skills are very important for individuals to interpret these problems they encounter and to solve them successfully and effectively. Coping strategies are a dynamic process that includes individual, cognitive, emotional and behavioral responses that are used to reduce the sources of events or factors that cause stress or psychological distress and to combat their negative effects.

The coping strategy to be used draws attention with its structure that varies from situation to situation (Lazarus & Folkman, 1984). The process of choosing a coping strategy depends on the stressor itself and the person's coping with it. When individuals perceive the source of stress as controllable, they use problem-focused coping strategies to solve the problem, but when they perceive the stressful situation as uncontrollable, emotion-focused coping strategies become operational as an attempt to manage the situation (Carver, Scheier, & Weintraub, 1989).

Spirito, Stark, and Williams (1988) classified the coping strategies used by adolescents as active coping, negative coping and avoidant coping strategies.

Active coping strategy: Stands out as a constructive coping strategy. It takes a positive attitude towards the problems, it consists of defining and understanding the problem, generating solution options, deciding which solution to apply and evaluating the results.

Avoiding coping strategy: It has non-functional features in problem-solving, such as avoiding problems, not taking action to solve them.

Negative coping strategy: It includes features such as perceiving the problem as a threat, not believing that it can be solved, and blaming oneself and others (Bedel & Kutlu, 2018).

Coping strategies that secondary school students implement in case of problems they confront have an important role (Positive coping lead to better psychological and mental health status among students) among the development tasks expected to be completed in the fields of individual and social development. In schools, a broad range of planning and implementation of facilitates for the purpose of early intervention and prevention in order to support adolescents academically, personal and social development. This kind of preventive implementations is also important in terms of being included within the scope of the Ministry of General Directorate of Special Education and Guidance and Counseling Services (2017).

In this study, in secondary school students; It is aimed to examine the relationship between self-esteem and coping strategies. It is thought that the results to be obtained from the study will contribute to self-esteem and coping strategies literature, as well as preventive and developmental guidance literature. Within the scope of this aim, a response to the following sub-goals wanted to search.

1) Is there a significant relationship between students' self-esteem scores and coping strategies scores?

2) Do students' self-esteem scores significantly predict coping strategies?
The results obtained in this study are expected to guide psychological counselors working in schools, to organize preventive guidance and psychological counseling programs. Planning and implementations for early intervention and prevention in schools are fundamental studies for psychological counselors.

**METHOD**

**Research Model**

This study was designed in a correlational design to reveal in the relationship between self-esteem and coping strategies. The correlational design is used to determine whether there is a relationship between two or more variables, and if so, what level it is (McMillan & Schumacher, 2006). The dependent variable in the research is coping strategies, independent variable is self-esteem.

**Participants**

This study was carried out with 523 participants from the 6th, 7th and 8th grades of two secondary schools in Aydın. The demographic information of the participants is given in Table 1 below.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>%</th>
<th>Grade</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>230</td>
<td>44.2</td>
<td>6th</td>
<td>157</td>
<td>30.2</td>
</tr>
<tr>
<td>Female</td>
<td>292</td>
<td>55.8</td>
<td>7th</td>
<td>238</td>
<td>45.5</td>
</tr>
<tr>
<td>Total</td>
<td>523</td>
<td>100</td>
<td>8th</td>
<td>127</td>
<td>24.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>523</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 1, the participants consist of 523 students, 230 males (44.2%) and 292 females (55.8%). In addition, when the distribution according to the classes is examined, it is seen that 157 of the participants (30.2%) are 6th grade, 238 (45.5%) are 7th grade and 127 (24.3%) are 8th grade students.

**Data Collection Tools**

**Kidcope**

The Coping Scale for Adolescents which was developed by Spirito, Starkand, and Williams (1988) and known as KIDCOPE in the international literature, was adapted into Turkish by Bedel, Işık and Hamarta (2014). Kidcope consists of 3 subscales: active coping, avoidant coping and negative coping. Internal consistency reliability coefficient of Kidcope was found as .72 for active coping, .70 for avoidant coping and .65 for negative coping. The test-retest reliability coefficient, which was evaluated three weeks apart, was found as r = .66 for active coping, r = .61 for avoidant coping, and r = .76 for negative coping. These results show that the Turkish form of the three-factor Kidcope is a valid and reliable measurement tool.

**Coopersmith Self-Esteem Scale**

Coopersmith's self-esteem scale was used to determine students' self-esteem levels. The scale was developed by Coopersmith (1967) and it was adapted to Turkish by Aksoy (1992) and Pişkin (1996). The scale, which consists of 25 items, consists of expressions marked in “like me” or “not like me”. In order to make an evaluation over 100 points, positive statements are scored as 4 and negative statements are scored as 0 points. Positive expression items in this form of the scale; These are the 1st, 4th, 5th, 8th, 9th, 14th, 19th and 20th items. Negative expression items are; 2., 3., 6., 7., 10., 11., 12., 13., 15., 16., 17., 18., 21., 22., 23., 24., 25. items. There is no clear limit on the scale showing low or
high self-esteem level. Therefore, 50 points is considered average and evaluation is made according to whether self-esteem is lower or higher than average. If the scores are below the average, the self-esteem is low, and the above average self-esteem is high. In the adaptation of the scale to Turkish, the reliability coefficient was calculated as .76 and the internal consistency reliability coefficient as .81 (Pişkin, 1996).

**Data Collection and Analysis**

The scales were applied to the students in groups, including classrooms. Relationships between CSA scores and Coopersmith Self-Esteem Scale total score were analyzed using the Pearson Moments Multiplication Correlation Coefficient Technique. The predictive power of coping on self-esteem was tested by multiple regression analysis. Analyzes were made with IBM SPSS 20.0 package program.

**RESULTS**

Whether there is a significant relationship between coping and self-esteem was investigated using the Pearson Moments Multiplication Correlation Coefficient Technique. The results for testing these relationships are given in Table 2.

**Table 2. Pearson's correlation levels regarding the relationship between coping and self-esteem**

<table>
<thead>
<tr>
<th></th>
<th>Active Coping</th>
<th>Avoiding Coping</th>
<th>Negative Coping</th>
<th>CSA Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>.289***</td>
<td>-.262***</td>
<td>-.420***</td>
<td>.149***</td>
</tr>
<tr>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>523</td>
<td>523</td>
<td>523</td>
<td>523</td>
</tr>
</tbody>
</table>

*** p<.001

When Table 2 is examined, it is seen that there are significant and positive relationships between the variables of CSA total score (r = .149, p <.001) and active coping (r = .289, p <.001) and self-esteem.

On the other hand, it is observed that there is a significant and inverse relationship between avoiding coping (r = -.262, p <.001) and negative coping (r = -.289, p <.001) and self-esteem.

Accordingly, it is understood that as the self-esteem score increases, the total score and active coping score of CSA increase, while the avoidant coping and negative coping scores decrease.

**Findings Regarding Whether Coping Predicts Self-Esteem Significantly**

The power of coping to predict self-esteem was tested by multiple regression analysis and the results are given in Table 3.

**Table 3. Multiple regression analysis results regarding the power of coping to predict self-esteem**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Standard Error</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Binary r</th>
<th>Partial r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>66.165</td>
<td>.714</td>
<td>.92</td>
<td>92.619</td>
<td>.000</td>
<td>-.289</td>
<td>-.292</td>
</tr>
<tr>
<td>Active Coping</td>
<td>.528</td>
<td>.077</td>
<td>.289</td>
<td>6.872</td>
<td>.000</td>
<td>.289</td>
<td>.292</td>
</tr>
<tr>
<td>Avoiding Coping</td>
<td>-.858</td>
<td>.119</td>
<td>.426</td>
<td>-7.209</td>
<td>.000</td>
<td>-.262</td>
<td>-.302</td>
</tr>
<tr>
<td>Negative Coping</td>
<td>-.1264</td>
<td>.114</td>
<td>.479</td>
<td>-11.129</td>
<td>.000</td>
<td>-.420</td>
<td>-.440</td>
</tr>
<tr>
<td>CSA Total Score</td>
<td>.450</td>
<td>.072</td>
<td>.396</td>
<td>6.211</td>
<td>.000</td>
<td>.149</td>
<td>.264</td>
</tr>
</tbody>
</table>

R=.504, R²=.254, F (3,519) = 58.559, p=.000

When Table 3 is examined, it is seen that the coping variable has a high level and significant relationship with self-esteem (R = 0.50, R2 = 0.25, p <.001). Accordingly, coping explains 25% of the
total variance in self-esteem. According to the standardized regression coefficient, the order of relative importance of the predictor variables on self-esteem is as follows: negative coping, avoiding coping, CSA total score, and active coping. When the t-test I results regarding the significance of the regression coefficients are examined, it is seen that negative coping, avoiding coping, active coping and CSA total score are significant predictors on self-esteem.

**DISCUSSION**

In the study, the relationship between self-esteem and coping strategies in secondary school students was examined and a significant relationship was found. Consistent with their search findings, there are studies in the literature showing that there is a positive relationship between self-esteem and coping strategies. The finding that there is a significant relationship between self-esteem and coping strategies obtained from the study is supported by other studies showing the significant relationship between self-esteem and coping strategies (Dolenc, 2015; Gücüyeter, 2003).

When adolescents use problem-focused coping, they deal with the problem in a more constructive way and feel better when dealing with a stressful situation. The use of an active coping strategy, which includes defining the problem, thinking about the solution options, applying and evaluating them, brings highly effective and functional results for the individual (Dolenc, 2015). Gücüyeter's (2003) study, which examined the relationship between the coping strategies used by adolescents and their self-acceptance levels. It was found that adolescents used more problem-solving and seeking social support strategies as their self-acceptance levels increased, and they used more avoidance strategies as their self-acceptance levels decreased supports the finding obtained from the study.

Findings obtained from other studies (D'Zurilla & Nezu, 2007; Hasegawa, 2018) support the findings of the study. In the study conducted by D’Zurilla and Nezu (2007), it was concluded that positive emotions increase performance in the process of problem-solving, while negative emotions suppress or inhibit problem-solving performance. Negative emotions such as negative self-evaluation and fear of dealing with the problem decrease problem-solving efficiency. Rather than seeing problems as an unsolvable situation, positive emotions felt when they are perceived as situations that can be overcome somehow facilitate the effectiveness of the problem-solving process (D’Zurilla & Nezu, 2007).

Negative thoughts and interpretations about himself, situations and future events may lead to a negative orientation to the problem. These negative interpretations can lead to an avoidance style that prevents him from solving the problem (Hasegawa, 2018). The findings obtained from the results of previous studies on the subject, that individuals who have deficiencies in self-esteem are individuals who have weak social problem-solving skills (Warden & Mackinnon, 2003), and who have deficiency in acquiring and using effective coping strategies (Wagner, 1993) support the findings of the study. In another study (Aşıcı & Sarı, 2021) the finding that coping strategies have a mediating effect on the relationship between well-being and cognitive flexibility supports the findings of the study. The finding obtained from the study of Yıldırım and Demir (2017), that there is a negative relationship between self-esteem and self-inhibition, is similar to the findings of the study. As students' self-esteem increases, their self-inhibiting tendency decreases.

Those with high self-esteem can cope with the situation by using their positive characteristics alternately when they perceive a threat to their self-worth, but those with low self-esteem can be more fragile and develop a defensive attitude because their repertoire of positive traits is limited (Barutçu Yıldırım & Demir, 2017). Self-esteem is also important in demonstrating positive social behavior. It was found that there was a significant and positive relationship between positive social behaviors and self-esteem level, and a significant and negative relationship with negative social behaviors (Çutuk, 2017). The finding of a positive relationship between social emotional health and self-esteem obtained from the study conducted by Petruylte, Guogiene, and Rimiene (2019) can be stated to be similar to the findings of the study. As self-esteem increases, social and emotional health of
adolescents also increases. It can be stated that the finding obtained by Moksnes (2018) in the study that there is a mutual relationship between self-esteem and mental health, and self-esteem positively predicts mental health, supports the study.

The finding obtained from another study (Çelenk & Peker, 2020) that self-esteem has a full mediating effect between coping styles with stress and psychological well-being supports the findings of the study.

Self-esteem development of adolescents is important in coping with changes in daily life and the distressing situations that may arise from these changes. High self-esteem individuals exhibit a more challenging attitude towards the problem, and are able to identify and use more individual and contextual coping resources. Individuals with low self-esteem may make more negative evaluations about themselves and their sources of coping. They may have difficulties in researching and using coping resources to cope with the problematic situation (Moksnes, 2019).

**SUGGESTIONS**

In this study, the relationship between self-esteem and coping strategies was examined and a significant relationship was found. It is very important to intensify consultation studies for families and teachers on attitudes that will nurture self-esteem in order to reach effective and productive results. In addition, it may be advisable to draw attention to the importance of students' participation in the teaching process and feeling successful in the classroom in terms of increasing their self-esteem, and in this direction, they may be advised to organize activities at a quality and level that will increase students' sense of success. Efforts should be made to prepare intervention programs that support students emotionally and socially and strengthen their self-esteem. Programs that increase self-esteem in school environments should be prepared, implemented and it is important to develop group activities.

Considering that children with low self-esteem may have low self-esteem in their adulthood, they may be more prone to pathological (anxiety, depression, etc.) factors and this will prevent individuals from establishing healthy and social relationships. From this point of view, the preparation and implementation of self-esteem enhancing programs for students with low self-esteem at their schools will bring long-term positive and productive results. Within the scope of preventive guidance and psychological counseling activities, intervention programs can be created for students to gain awareness of coping strategies and to make effective coping strategies work. Within the scope of these studies, activities of personal-social counseling (social problem-solving, effective communication skills, assertiveness, social problem-solving, etc.) can be included in the development of coping strategies.

In the study conducted by Gücüyeter (2003), it was found that as the level of self-acceptance of adolescents increased, they used more active coping strategies in problem situations, and they used avoidance strategy as their level of self-acceptance decreased. Psycho education programs to increase students' self-esteem can be expanded.

Adolescents who face many emotional, physiological and psychological problems may not be at a sufficient level to use coping strategies effectively. Social support from family, teacher and friends is very important in dealing with the problems experienced effectively. It is very important to involve parents and teachers in the intervention studies that aim to provide students with the skills to use coping skills effectively.

In the regulation prepared by the Ministry of National Education (2017), the importance of raising awareness by using interviews, home visits and education programs in providing guidance service to families on this issue has been emphasized again. Seminars on the subject can be organized by field experts for the school administration, staff and teachers. Individual and group counseling can be used to improve effective coping strategies and self-esteem.
LIMITATIONS

This study contains some limitations on the characteristics of the study group. These limitations should be considered while generalizing the results. This study is limited to a sample of public secondary school students in Aydın. Working with students from public and private secondary schools in different cities can be enriched. Repeating similar studies in samples other than secondary school students (primary school and high school) will contribute to the literature. It is thought that the larger the size of the sample and its repetition on larger samples will be beneficial.

The data obtained from this study are only based on students' self-expression. In new research, teachers 'and parents' observations on coping strategies and self-esteem can be included.

REFERENCES


Identifying the Values to be acquired by the Students in Inclusive Classrooms based on the Views of the Classroom Teachers

Tansel Yazıcıoğlu
Nevşehir Hacı Bektaş Veli University

Vedat Aktepe
Nevşehir Hacı Bektaş Veli University

Abstract

The general goal of special education and inclusive education is to socialize students. Socialization refers to individuals’ attempts to participate in their immediate environment through the acquisition of certain knowledge, skills, values and behaviors. The basis of socialization in formal education systems is the educational programs and particularly, the educational program of social studies courses. Identifying which of values contained in the educational programs should be taught to students is very significant to reevaluate these values and to allow classroom teachers to develop common values for inclusive classrooms. The study aims at identifying the values to be acquired by students in inclusive classrooms. The participants of the study are primary school teachers who work at primary schools in Nevşehir province of Turkey. In the study, qualitative method was used, and the data were collected through semi-structured interview questions and analyzed by content analysis technique by using inductive approach. The findings of the research show that the most frequently cited value for the students with no special education is empathy. The findings of the research also show that the participants mostly employ individual study in value education in the context of inclusive education.

Keyword: Human Values Empathy, Individual Study, Inclusive Classes

DOI: 10.29329/ijpe.2022.426.4
INTRODUCTION

Inclusive education refers to an educational process which enables students with special needs to participate in learning environment and therefore, classroom setting reducing their exclusion and which meets the needs of all students. This process includes educating all children in the appropriate age range with a shared vision under the responsibility of the general education system, adaptation and changes in course contents, teaching and learning approaches, structures and strategies (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2005). Through this approach students with special needs are offered the same teaching and learning opportunities which are also provided to their peers in the same educational settings. Therefore, all these students share their experiences with one another and learn something from one another (Frankel, 2004). Such exchanges of experiences are mostly about the values of individuals and society. In Turkish dictionary (2011) the word value refers to the material and spiritual elements containing social, cultural, economical and scientific values that a nation has. Aktepe (2019) states that the goal of value education is to transform the accepted values into knowledge, skills and behaviors among individuals. In addition in value education it is aimed to contribute to the development of the personality development and humanistic characteristics of the individuals, to help them to be in harmony with themselves and society and to ensure that they are raised as good people in the light of moral values. Therefore, values should also be taught in inclusive classroom to improve the social development, affective and cognitive development of students with special needs. In other words, value education in inclusive classrooms should be given importance.

Inclusive education has also significant effects on students with no special needs. One of such effects is the change in their perspectives. Through such perspective changes their attitudes towards inclusive students become much more positive as a result of the elimination of bias. In addition, students with no special needs learn to be tolerant towards inclusive students, to be helpful and to share (Acarlar, 2016; Campbell, Gilmore & Cuskelly, 2003; Hayward, 2006). The general goal of special education and inclusive education is to socialize students. Socialization refers to individuals’ attempts to participate in their immediate environment through the acquisition of certain knowledge, skills, values and behaviors (Ozpolat, 2009). The basis of socialization in formal education systems is the educational programs and particularly, the educational program of social studies courses (Ozmen, 2009). Such courses at the primary education are social studies and life sciences. The educational programs of these courses in 2015 (Ministry of National Education, [MONE], 2015a, 2015b) and the latest educational programs (MONE, 2018a; 2018b) include thirty-three values as reported by Aktepe and Gunduz (2019). These values are as follows: fairness, attaching importance to family unity, modesty, independency, peace, scientificness, generosity, diligence, solidarity, friendship, sensitivity, honesty, empathy, aesthetics, equality, sacrifice, tolerance, mercy, hospitality, freedom, self-control, self-confidence, self-respect, sharing, patience, respect, love, responsibility, savings, cleanliness, patriotism, fidelity and helpfulness. Aktepe and Gunduz (2019) categorize the values in the following groups: national values, religious values, universal values, human values, individual values and social values. Identifying which of these values contained in the educational programs should be taught to inclusive students is very significant to reevaluate these values and to allow classroom teachers to develop common values for inclusive classrooms. For instance, Esmer, Yilmaz, Gunes, Tarm & Delican (2017) conclude that inclusive students experience some problems such as shyness, exclusion and peer pressure.

Research indicate that although inclusive students attend the classes they cannot achieve socialization and cannot improve their communicative skills and also, have underachievement and various problems (Gresham, 1986; Guralnick, 1990; Kabasakal, Girli, Okun, Celik & Vardarlı, 2008; Myles, 2003; Wang, 2009; Zirpoli & Melloy, 1997). The goal of inclusive education is to improve the social and personal development of students and make them an integrated part of the society. Therefore, the following question should be answered: Which values should inclusive students acquire to increase their academic success and not to experience social problems? There is no study directly dealing with these values that inclusive students should acquire. However, there are some studies
which analyse the problems that students with special needs come across and the empathy levels of the students in inclusive classrooms (Sahin, 2010; Bahar, 2018).

Based on the data of the MONE during the school year 2018-2019 there were 116,816 inclusive students, and 1,260 were attending pre-school institutions and 115,556 primary schools (MONE, 2019). Thus, it shows that classroom teachers may teach inclusive students. Therefore, it is significant to identify which values should be acquired by the students in inclusive classrooms. Such an information will contribute to the educational programs and improve the student achievement in inclusive education settings. The study aims at identifying the values to be acquired by students in inclusive classrooms. In line with this aim the study attempts to answer the following research questions:

1. What are the values to be acquired by the students in inclusive classrooms?
2. How can these values be categorized?
3. What are the reasons for the acquisition of these values by the students in inclusive classrooms?
4. Which teaching and learning methods and techniques are used in value education in such educational settings?

METHOD

Design of the study

This study was designed with the case study design out of qualitative research approaches aimed at providing the researcher with detailed and in-depth data collection, direct learning of the participants' individual perceptions, experiences and perspectives, and understanding and explaining the current situations (Patton, 2014). Case study analyzes one or more cases in a holistic way with factors such as environment, time, individual, event, and process. Since the situations are different, there are no generalizations of the results. However, it is expected that the results obtained in relation to a situation have been formed by examples and experiences for understanding similar situations (Yildirim & Simsek, 2018).

Participants

The participants of the study are primary school teachers who work at primary schools in Nevşehir province of Turkey. The participants worked at criterion sampling, which is one of the purposive sampling methods, was used to collect the qualitative data of the study. Criteria used to identify the participants are as follows: (1) being a classroom teacher, (2) having at least five years teaching experience, (3) teaching at least one inclusive student and (4) teaching inclusive students at least for one semester. All school administrators were called with phone to see whether or not any inclusive student was at school. In order to select the participants of the qualitative part of the study seven public primary schools in Nevşehir province were visited and information about the eligible classroom teachers was taken from the school administrators. Then interviews were made with these teachers and at the end seven teachers accepted to take part in the study. Of them one is male and six are female.

Data collection tool

The data of the study were collected through the interviews. Interview items were developed based on the review of the related studies. A total of four items were developed for the interviews. These items were reviewed by four field experts (two experts with PhD in classroom teaching and two experts with PhD in special education). Based on the expert feedback the items were modified. In order to establish the intelligibility of the interview items a pilot study was conducted with two
classroom teachers. The feedback from these two participants showed that items are sufficiently understandable.

Data analysis

The study was carried out in Nevşehir province during the school year of 2019-2020. The data of the study were collected between 6 and 27 January 2020. The data of the study were collected through interviews with seven classroom teachers. Although seven classroom teachers reported that they could participate in the interviews, later one of them declined to participate in the interview. The items were sent to her and she replied them through an email message. The answers of six participants to the interview items were recorded. The interview data were transcribed and produced eighteen-page data.

Content analysis was used to examine the qualitative data. In content analysis the data are conceptualized and these concepts are organized to have themes which account for the data (Yıldırım & Simsek, 2018). In the study first interview data were transcribed. In order to establish the reliability of the study five transcribed recordings which were randomly selected were reviewed by an expert on special education. Then the codes were developed and then, these codes were categorized based on the themes. The themes were further divided into subthemes. Codes and themes were reviewed by two experts one who was a special education expert and the other one was an expert on value education. Three themes and seventeen subthemes were developed for which mutual agreement was achieved.

FINDINGS

The themes developed based on the analysis of the interview data are given in Table 1, Table 2 and Table 3.

Table 1. Values to be acquired by the students in the inclusive classes

<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Codes</th>
<th>Quotations</th>
<th>Teacher codes</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human values</td>
<td>Empathy</td>
<td>K4: “Of these values the most significant one for me is empathy…”</td>
<td>K3, K4, K5, K8</td>
<td>4</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>K2: “I generally want students in my classroom, to be tolerant, respectful and helpful…”</td>
<td>K2, K3, K8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Sharing</td>
<td>K7: “Acting independently, solidarity and self-confidence and sharing, independence…”</td>
<td>K2, K7, K8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Tolerance</td>
<td>K2: “I generally want students in my classroom, to be tolerant, respectful and helpful…”</td>
<td>K2, K5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>K5: “Empathy, sensitivity, tolerance compassion, patience, sacrifice. I think that students should acquire these values.”</td>
<td>K3, K5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Mercy</td>
<td>K8: “Students need to acquire the values of empathy, justice, sharing and solidarity, compassion, love and respect.”</td>
<td>K5, K8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Devotion</td>
<td>K5: “I think that students need to acquire the values of empathy, sensitivity, tolerance compassion, patience, devotion.”</td>
<td>K5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Universal values</td>
<td>Affection</td>
<td>K3: “For me the first one is respect. Then empathy, respect for differences, sensitivity, affection, helpfulness.”</td>
<td>K3, K4, K8</td>
<td>3</td>
</tr>
<tr>
<td>Fairness</td>
<td>K4: “Of these values the most significant ones are empathy, fairness and solidarity. For me these three values are extremely significant.”</td>
<td>K4, K6, K8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td>K8: “Inclusive students should acquire the values of self-confidence, self-expression, self-esteem, responsibility.”</td>
<td>K2, K4, K8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Respect</td>
<td>K3: “For me the first one is respect. Then empathy, respect for differences, sensitivity, affection, helpfulness.”</td>
<td>K2, K3, K8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Respect for differences</td>
<td>K3: “For me the first one is respect. Then empathy, respect for differences, sensitivity, affection, helpfulness.”</td>
<td>K2, K3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Respect for national heritage</td>
<td>K2: “I want to raise students that respect for their cultural heritage, develop a self-identity, think through interpretation and not judge their friends.”</td>
<td>K2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
As can be seen in Table 1 the values emphasized by the participants to be acquired by the students in inclusive classrooms are classified into several categories. They mostly emphasized the human and universal values and less emphasized the national and religious values. Table 1 shows that they preferred the following human values as the necessary skills for the students: empathy (4), helpfulness (3), sharing (3), tolerance (2), sensitivity (2), compassion (2) and sacrifice (1). They mostly mentioned the following universal values: affection (3), justice (3), responsibility (3), respect (3), respect for differences (2) and respect for cultural heritage (1). The mostly cited social values are self-confidence (3) and self-esteem (1). They emphasized the social values of solidarity (2) and diligence (1). The most cited national value is independence (1) and the most cited religious value is found to be patience (1).

Table 2. Reasons for the acquisition of the values by the students in inclusive classes

<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Codes</th>
<th>Quotations</th>
<th>Teacher codes</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Empathy</td>
<td>K5: “Empathy, it is very important to be able to think the situation of the others. Then I think they will understand better the situation their friends.”</td>
<td>K5, K4, K5, K6, K8</td>
<td>5</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Being respectful to differences</td>
<td>K2: “As long as these children are tolerated more and being respectful for different thoughts, I believe that these inclusive students will be more comfortable in classrooms. But respect for differences must, of course, be effectively given in every class.”</td>
<td>K2, K3, K4</td>
<td>3</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Respect</td>
<td>K3: “When the inclusive student do or say something funny they do not laugh at him, they aware of the fact that he is like them. If they do not respect for their friend, it makes me angry.”</td>
<td>K3, K6, K8</td>
<td>3</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Being aware of some restrictions of the inclusive students</td>
<td>K3: “For instance, sensitivity, instead of complaining about the inclusive students, they now understand these students.”</td>
<td>K3, K4</td>
<td>2</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Sensitiveness</td>
<td>K4: “Solidarity, I said solidarity, it is needed to help other children who are already troubled, to make other children be more sensitive to them in order to solve their problems better.”</td>
<td>K4, K5</td>
<td>2</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Being tolerant</td>
<td>K3: “…I don’t know what would be if they are in a different class or if they had different people, but my students at least make more effort.”</td>
<td>K3, K5</td>
<td>2</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Acceptance</td>
<td>K3: “My students accepted their inclusive friend. They love him and do not have any problem with him.”</td>
<td>K3, K5</td>
<td>2</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Being merciful</td>
<td>K5: “Being merciful is very important. This value should be acquired by all students. The feeling of compassion is a must for every student, but I think it is more important in such situations. So I think it's more important.”</td>
<td>K5, K8</td>
<td>2</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Being devoted</td>
<td>K5: “I want them to make sacrifices, they have to sacrifice some things. For example, our inclusive student can do something different in the middle of the lesson. So this means that the students have to sacrifice their lesson, even a minute or two at the moment.”</td>
<td>K5</td>
<td>1</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Being compassionate</td>
<td>K3: “…When the others are uncomfortable due to the behavior of the inclusive student, they at least try to understand him. So they are compassionate towards him.”</td>
<td>K3</td>
<td>1</td>
</tr>
<tr>
<td>Expected behaviors from students with no special needs</td>
<td>Not to mock</td>
<td>K3: “When the inclusive student do or say something funny they do”</td>
<td>K3</td>
<td>1</td>
</tr>
</tbody>
</table>
not laugh at him, they aware of the fact that he is like them. They begin to understand him.”

Table 2 shows that the reasons for the acquisition the of values by the students are categorized into several groups: for the students with no special education needs, for the students with special education needs, for all students and for the classroom teachers. There is only one reason in relation to the significance for society. The reasons for the acquisition the of values by the students with no special education needs are as follows: empathy (5), being respectful for differences (3), respect (3), being merciful (2), being devoted (1), being compassionate (1) and not to mock (1). The reasons for the acquisition the of values by the students with no special education needs are as follows: improving the self-confidence (2), improving the sense of responsibility (1), effective communication (1), improving sense of sharing (1) and being independent (1).

The reasons for the acquisition the of values by all students are as follows: requirements of daily life (4), being helpful (3), changing perspectives (2) and solving the daily life problems (1). The reason for the acquisition the of values by the classroom teachers is as follows: being positive (2). The reasons for the acquisition the of values due to the significance for society is as follows: being basis for the society (1).
Table 3. Methods and Techniques Used for Value Education in Inclusive Classes

<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Codes</th>
<th>Quotations</th>
<th>Teacher codes</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using individual work techniques</td>
<td>Assigning tasks</td>
<td>K7: “A good example for is that my students record a classroom notebook. For instance, handwriting of the inclusive student was not so nice before. When he wrote down nice, I showed it to the class telling “Look he wrote down very nice.”. Now one of the nicest notebook belongs to him.”</td>
<td>K2, K4, K7</td>
<td>3</td>
</tr>
<tr>
<td>Assigning homework Practices</td>
<td>K2: “He perceives the things differently, so I assign him different homework that he could do to support his self-confidence.”</td>
<td>K2, K6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Learning by doing</td>
<td>K4: “…I try to make him gain these values by explaining it verbally and making practices.”</td>
<td>K4, K7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Visuals</td>
<td>K2: “I generally follow the principle of learning by doing or I assign him tasks if he is active.”</td>
<td>K2, K4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Drawing pictures about the topic</td>
<td>K2: “…If the student can comprehend the visuals I use these visuals.”</td>
<td>K2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Poems or essays about the topic</td>
<td>K2: “I usually want the students to draw pictures about the related subjects.”</td>
<td>K2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Poems or essays about the topic</td>
<td>K2: “In this way, I present the values in the classroom through poems about those topics, articles that indicate the meaning and importance of the subject and special days and weeks in the class.”</td>
<td>K2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Repetition</td>
<td>K2: “I generally use repetition for such students, the experience of the students shed light on my choice over the techniques.”</td>
<td>K2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Using technology</td>
<td>K2: “The inclusive student is interested in technological devices. Given that such devices make students much more motivated visually we use such devices in the classroom.”</td>
<td>K2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Case studies</td>
<td>Experiences</td>
<td>K2: “I generally use repetition for such students, the experience of the students shed light on my choice over the techniques.”</td>
<td>K2, K4, K6, K7</td>
<td>4</td>
</tr>
<tr>
<td>Case study</td>
<td>K8: “I employ the case study, drama, problem solving methods.”</td>
<td>K2, K4, K6, K7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Repetition</td>
<td>K5: “For instance, I use fairy tales or stories which include these issues (patience) - we have story books on this subject – I read these texts, give them examples and share them with my students.”</td>
<td>K5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Using sample texts</td>
<td>K5: “I generally use repetition for such students, the experience of the students shed light on my choice over the techniques.”</td>
<td>K2, K4, K6, K7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Drama methods</td>
<td>Drama</td>
<td>K8: “I employ the case study, drama, problem solving methods.”</td>
<td>K3, K6, K8</td>
<td>3</td>
</tr>
<tr>
<td>Concretisation</td>
<td>K6: “I use drama to make the topics much more concrete…”</td>
<td>K6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Rol-playing techniques</td>
<td>Animation</td>
<td>K7: “I try to participate him more in activities such as storytelling or animation.”</td>
<td>K7</td>
<td>1</td>
</tr>
<tr>
<td>Story telling</td>
<td>K7: “I try to participate him more in activities such as storytelling or animation.”</td>
<td>K7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Gamification</td>
<td>K7: “For instance, we play games or use play dough: Then I tell them that ’come here and make a thing with it.” I also tell them “make decision over what to do with it.””</td>
<td>K7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Being a model</td>
<td>K5: “Children imitate you (teachers). We are models for them. They imitate me. So I tolerate them and be patient to them. Students see my behaviors. So they imitate us. Not to be angry at the mistakes he made and by being more tolerant. They see us.”</td>
<td>K5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lecture methods</td>
<td>Lectures</td>
<td>K3: “I just lecture in the process.”</td>
<td>K3, K4, K5</td>
<td>3</td>
</tr>
<tr>
<td>Question-answer pairs</td>
<td>Asking questions</td>
<td>K6: “I use question-answer pairs. I ask questions and want them to answer these questions.”</td>
<td>K6</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3 indicates that the participants mostly employ individual study in value education in the context of inclusive education. They are found to less use lectures and question-answer pairs for this purpose. Table 3 also show the other methods and techniques used by the participant to teach the values in inclusive classrooms: case studies, drama and role-playing. Under the category of individual study the participants prefered the following: assigning tasks (3), assigning homework (2), practices (2), learning by doing (2), using visuals (1), drawing pictures about the topic (1), writing poems and essays about the topic (1), repetition (1) and using technology (1). Under the category of case study they reported that they used experiences (4), analysis of cases (3) and using sample texts (1). Under the category of drama techniques they used drama (3) and concretization (1). Under the category of
role-playing they used animation (1), storytelling (1), gamification (1) and being a model (1). They also reported to use lectures (3) and question-answer pairs (1).

DICUSSION AND CONCLUSION

The participants generally reported that students should first acquire human values and then, universal rights. This finding of the study shows that social aspects of education are taken into consideration in inclusive classes and also, an understanding based on human rights is adopted. It is satisfying and acceptable. Indeed, inclusive education is generally accepted as a multi-dimensional concept and is a socio-political education model that includes values such as human rights, social justice and social equality. It also contains the dimensions of access to education, educational rights and transition to formal education (Kozleski, Artiles and Waitoller, 2011; Loreman, Deppeler, and Harvey, 2011; Mitchell, 2005; Slee, 2011; Smith, 2010; Topping, 2012). For this reason, emphasizing the human values is an approach that overlaps with the philosophy of inclusive education.

When the findings of the study on universal values are evaluated, it is seen that values such as fairness, affection, responsibility and respect come to the fore. According to Gurgor (2019), it is important to be fair in human life. Because issues such as individual happiness, awareness of rights, social life, tolerance, level of development and protection of personal rights are valued together with the value of fairness. As a matter of fact, Yildirim (2011) found in his study that students care about social justice and generally consider it within the scope of equality of opportunity and rights. In this study, teachers may have pointed out that every student has equal rights and that all students' rights are protected. In the findings of the research, it is seen that the value of affection is as important as the value of fairness. Affection is the common feeling of people. In this sense, a person full of affection is respectful, tolerant and happy (Kiliç, 2019). After all, it can be said that affection is the basic element of being human. For this reason, it is thought that it is important to keep affection alive in inclusive classes.

Research findings reveal that self-confidence is seen as another important value in inclusive classes. According to Aşılıoğlu (2019), self-confidence means being satisfied with being oneself and living in peace with himself and his environment as a result. For this reason, self-confidence is known as a factor affecting learning. In addition, high or low self-confidence affects the behavior and emotions of the individuals (Soner, 2000). Therefore, with self-confident students can be effective in achieving the purpose of inclusive education. Likewise, self-esteem is seen as important in inclusive classes. The high self-esteem of individuals enables them to adapt to the society they live in and to be an active member of the society. In addition, high self-esteem positively affects individuals' thoughts, behaviors and moods. It brings them happiness and success in their lives. Self-esteem has an effect on the development of a healthy personality, self-expression, self-reliance and life satisfaction. Individuals with low self-esteem, on the other hand, may have problems in adapting to social relationships, accepting themselves as they are, and in friendships (Atlay, 2019; Bulut, 2016). In addition, social life skills develop thanks to sharing among students, integration with society increases thanks to interaction, and thus both socialization and self-esteem of students increase (Metin, 2018; Staub, Peck, Gallucci, & Schwartz 2000).

It is important for classroom management to be tolerance of teachers and students in inclusive education. Having equal rights for every individual requires being flexible and tolerance to all students (Akalin, 2015; Sucuoglu & Kargin, 2006; Sahin, 2010). In the findings of this study, teachers drew attention to the value of tolerance. This shows that the value of tolerance is valued by teachers and seen as an important value for inclusive classes. As a matter of fact, it is stated in the literature that respect and tolerance for differences among students are indispensable for life (Madden & Slavin, 1983; Metin, 2012, Sahin, 2010).

Research findings show that sharing, solidarity and cooperation values are important in inclusive classes. This situation is consistent with the results of the researches in the literature. As a matter of fact, it is important for the child to receive help from his peers in terms of self-esteem,
attitude towards school and social acceptance (Calhoon & Fuchs, 2003; Esmer, Yiilmaz, Gunes, Tarim & Delican, 2017; Karaca, 2018, Metin, 2018; Snell & Janney, 2000). The findings of the study indicate that teachers mostly have an expectation of behavior from students who do not have special needs in inclusive classes. It may suggest that teachers generally attach importance to teach values to these students in inclusive classrooms. The most frequently cited value for the students with no special education is empathy. In fact, empathy is one of the most necessary elements in achieving effective inclusive education. Empathy is the ability to understand the emotional state of other people and react emotionally accordingly, and empathy prevents the emergence of interpersonal communication problems and minimizes conflicts (Piskin, 1994). Previous findings on empathy inclusive education indicate that empathy prevents some undesired feelings and behaviors such as selfishness, oppression, not listening to the other, rejecting the other, lack of communication and developing negative emotions (Bahar, 2018; Dokmen, 2005).

While the teachers talked about the behaviors expected from students without special needs, they also emphasized the behaviors expected from students with no special needs. This situation can be considered as teachers’ holistic approach to inclusive education and their emphasis on the roles of students without special needs in inclusive education. This approach is important for the success of inclusive education. In fact inclusive education is an approach which aims at making students aware of the differences among them and be respectful to their friends (Salend, 1998). In addition, this approach was developed to meet the needs of all students (Ferguson, 1996). Based on the conclusions of the study it appears that in order for the students with special needs to gain values, all students in inclusive classrooms must have acquired these values and all students in the school must have transformed these values into behavior as a whole.

In the study it is found that the participants mostly employ individual study in value education in the context of inclusive education. They are found to less use lectures and question-answer pairs for this purpose. This finding reminds us the significance of the individualized education programs (IEPs) in inclusive education. Because in order to meet the needs of students with special needs in inclusive classes, plans are prepared based on the individual differences among the students (Martin, Van Dycke, Christensen-Greene, Gardner & Lovett, 2006). Fiscus and Mandell (2002) argue that the IEPs are required to meet the needs of students with special education needs. Although the participants of the study did not mention the IEPs, they reported that they employed some individual study techniques such as assigning homework, assigning tasks, practices, learning by doing, using visuals, drawing pictures or writing poems or essays about the topic, repetition and using technology. However, the question is whether the individual working methods and techniques used by the teachers were employed in line with the IEPs which were specifically prepared for students with special needs. Because the main purpose of the IEPs is to provide students with special needs the educational opportunities that they can utilize at the highest level (Vuran, 2007).

REFERENCES


Kılıç, A. (2019). *Primary school fourth grade students' perceptions of love value*. (Master's Thesis) Recep Tayyip Erdogan University Institute of Social Sciences, Rize.


Sahin, A. (2010). *Examination of the problems faced by students who receive education through inclusion in the socialization process according to the opinions of teachers (Erzurum province example)*. (Master Thesis), Atatürk University Institute of Social Sciences, Erzurum.


The Reasons of Syrians Learning Turkish as a Second Language, Their Perceptions of Turkey and Their Future Expectations

Önder Çangal
Gaziantep University

Abstract

The Syrian question has not remained as an internal conflict; instead, it has affected both Turkey as well as whole Europe. According to 2020 statistics, approximately three and a half million Syrians reside in Turkey, and approximately 850 thousand of these Syrians are young people between the ages of 15-24. The determination of the reasons why the young population who could be regarded as the future of the Syria learn Turkish, their perceptions of Turkey and expectations from the future, is vitally important for both the proper administration of their process’ of learning Turkish as a second language, as well as for the planning of the future of the young Syrians. This study, which aims to determine the reasons why Syrians who choose to learn Turkish as a second language, their perceptions of Turkey and expectations from the future, has been prepared per the qualitative research model. An interview form to be used in the study was prepared by the assistance of experts in the field and the form was administered to sixty-six participants. The data were analyzed by using the descriptive analysis method. According to the results of the research, Syrians want to learn Turkish in order to meet their basic needs, to get education, to find a job, to work and to eliminate communication problems in daily life. Language, education, finding a job, adaptation problems, university placement and getting an identity card stand out as the issues that Syrians have difficulties in Turkey. 52.1 percent of the young people plan to graduate from university and begin working immediately. The most important factor in this is that people have families they are responsible for and they have to make a living. The future expectations of young people, who are struggling to learn a language, receive higher education, find a job and continue their lives, look for security, peace, stability and success. Syrian young people want to leave the war behind and carry on the future with hope. In this context, it is necessary for all countries to accept their responsibilities and to determine a common framework for the solution of the problem.

Keywords: Teaching Turkish as a Second Language, Language Needs Analysis, Syrians' Perception of Turkey and the Future.

DOI: 10.29329/ijpe.2022.426.5

---

Önder Çangal, Dr., Department of Turkish Language, Gaziantep University, ORCID: 0000-0002-8560-3526
Email: ondercangal@hotmail.com
INTRODUCTION

People have had to migrate to other geographies by leaving their homeland behind for various reasons in every period from the first age to the present. Although migration movements are generally based on improving living conditions and establishing a good future, it has been known that people have to migrate due to drought, famine and war. “The chaotic situation that arose in the country in the month of April as consequence of demonstrations known as the Arab Spring that began on 15 March 2011 evolved into the Syrian Crisis, which, in turn, led the country into a civil war. Consequently, when the civil war spread across the country and life became unbearable, Syrians, who felt themselves under threat and were unable to provide their basic necessities and security, decided to leave the country (Tunç, 2015, p. 35).

The wave of immigrants that Turkey was faced with was not something anticipated, and in that sense, Turkey was caught unaware in the face of this intense wave of immigration. With the onset of wave of immigration, camp centers, also called temporary protection centers, were set up in the border provinces. “The number of camps began to be insufficient due to the protracted civil war and as a result some Syrian refugees / asylum seekers began to stay with their relatives or in rented houses in border provinces or districts instead of camps” (Tümeğ, 2018, p. 15). The increase in the number of Syrians who had to immigrate to Turkey and establish an order here has revealed the need for some legal arrangements. Thereupon, in 2013, in order to regulate the rights of Syrians residing in Turkey, Turkey's first law on asylum, the “Foreigners and International Protection Law”, was adopted by the Turkish Grand National Assembly, the law was passed on April 11, 2014 and with the law, Immigration Management Law was adopted, and General Directorate was established.

It is noteworthy that, of the nearly three and a half million Syrians in Turkey, 830 thousand 626 are young population within the age range of 15-24 (Refugees Association, 2019). The period of transition from childhood to adulthood brings along some problems for each individual, because individuals experience both physical and psychological changes in this period, which is called adolescence. Getting to know the worlds of thought of the young Syrians, who were forced to confront the truth of war and migrate to Turkey in such a period, will both facilitate the process of teaching Turkish as a second language and planning of the future of these students. Therefore, in this study, the reasons why Syrian students who are learning Turkish as a second language preference, their perceptions of Turkey and their expectations from the future has been reviewed.

Purpose of Research

The purpose of this study is to determine the reasons why Syrians who prefer learning Turkish as a second language, their perceptions of Turkey and expectations from the future; and evaluate the findings in that regard. In accordance with this purpose, the answers to the following research questions are sought in the study:

Syrians learning Turkish as a second language;

1. What are the reasons for learning Turkish?
2. What are their thoughts on Turkey?
3. What are their expectations for the future?

METHOD

Research Design

The study was conducted according to the qualitative research model. “Qualitative research is carried out in conjunction with a long-term and intensive interaction process with a cross-section of a
field or social life. These processes reflect the everyday lives of individuals, groups, societies and organizations” (Miles & Huberman, 2016, p. 6).

The current study is a case study aimed at revealing why the Syrian students who learn Turkish as a second language preference, their perceptions of Turkey and expectations from the future. The case study is “a research method based on questions of how and why, allowing the researcher to examine the depth of a phenomenon or event that the researcher cannot control” (Yıldırım & Şimşek, 2018, p. 289).

Sample/Study Group

Criterion sampling was used in the study. According to criterion sampling, “in a study, observation units can be created from people, events, objects, or situations with certain qualifications. In such a case, units that meet the criteria set for the sample (objects, events, etc.) are included in the sample” (Büyüköztürk et al., 2016, p. 92). The criteria set by the researcher for sample selection in the study are “being Syrian and having learned or being learning Turkish as a second language in Turkey.”

The sample of the study consists of Syrian students who are learning Turkish as a second language in higher education institutions in Turkey and who are resuming their education at the same university in the 2018-2019 academic year. 66 students participated in the study. There were no rewards or obligations set for participation in the study; instead, the study was conducted on a voluntary basis.

Demographic information about the participants is as follows:

<table>
<thead>
<tr>
<th>Table 1. Demographic data of the study group</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Place of Birth</td>
</tr>
<tr>
<td>Syria</td>
</tr>
<tr>
<td>Aleppo</td>
</tr>
<tr>
<td>Damascus</td>
</tr>
<tr>
<td>Homs</td>
</tr>
<tr>
<td>Idlib</td>
</tr>
<tr>
<td>Hama</td>
</tr>
<tr>
<td>Deir ez-Zur</td>
</tr>
<tr>
<td>Daraa</td>
</tr>
<tr>
<td>Educational Institution</td>
</tr>
<tr>
<td>State University</td>
</tr>
<tr>
<td>Private University</td>
</tr>
<tr>
<td>Duration of Stay in Turkey</td>
</tr>
<tr>
<td>1-3 years</td>
</tr>
<tr>
<td>4-6 years</td>
</tr>
<tr>
<td>7 years +</td>
</tr>
<tr>
<td>Language Levels</td>
</tr>
<tr>
<td>A1</td>
</tr>
<tr>
<td>A2</td>
</tr>
<tr>
<td>B1</td>
</tr>
<tr>
<td>B2</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>C2</td>
</tr>
</tbody>
</table>

Twenty-seven of the participants (40.9%) are female, whereas thirty-nine (59.1%) are male. As the target group of the study involves students at higher education level, the ages of the participants ranged from 18 to 30. The age range in which the participants converge is between 20-25 years of age. The current situation in Syria and the ongoing civil war seriously crippled people's education; they had
to take a break from their education or put aside their higher education and start university in Turkey all over again.

17 of the participants responded to the question of which city they were born in as “Syria” without specifying the name of the city. The rest, 20 reported Aleppo as the city where they were born, while 10 reported Damascus, 7 Homs, 6 Idlib, 3 Hama, 2 Deir ez-Zur and 1 Daraa. The largest cities of Syria are Damascus, Aleppo and Homs, respectively. When the percentages of the participants are examined, it is seen that It was seen that the participants mostly come from these 3 cities.

The participants attend 19 different universities in Turkey. 12 of these universities are public universities, while 7 are private universities. Istanbul stands out with 10 universities among the cities where the universities are located. “As of November 2019, among our cities, Istanbul is the city that houses the highest number of Syrians with 552,080 people” (Refugees Association, 2019). The universities of Firat, Gaziantep, Harran, Iskenderun Technical, Kahramanmaras Sutcu Imam, Kilis 7 Aralik and Mersin are universities located in cities that are geographically close to Syria. Apart from these universities, 2 participants from Usak University took part in our study.

It is seen that the durations of the participants’ stay in Turkey varies between 1 and 7 years. 17 of the participants came to Turkey during last year. Therefore, the durations of these people’s stay in Turkey were described as one year or less. Half of the participants came to Turkey during the past three years. 14 of the participants have been living in Turkey for four years, 10 for five years, 7 for six years and 2 for seven years. In order for the participants to give comprehensive responses to the questions about their perceptions of Turkey, the time they have lived in Turkey is important. This situation was given attention during the process of descriptive analysis, and a point of including the views of Syrians who had been living in Turkey for two or longer years was made.

Most of the participants (93.9%) answered “Yes” to the question “Do you speak Turkish?” Only four people (6.1%) responded “No, I do not speak Turkish.” These four students are students who have just started learning Turkish as a second language at TÖMER and their levels are marked as A1. 6 of the students who spoke Turkish described the level of their knowledge of Turkish as A1, 10 as A2, 15 as B1, 5 as B2, 26 as C1 and 4 as C2. A significant portion of the participants (30 of them) speak Turkish proficiently, i.e., at the levels of C1 and C2. 20 of the participants speak Turkish at an intermediate level while 16 of them speak Turkish at a basic level. For the students who are at basic or intermediate level and continue their courses in the department, the language of instruction at the faculty is English or Arabic. These students both attend their lectures at the faculty and simultaneously learn Turkish as a second language at TÖMER.

Data Collection Tool and Analysis of the Data

An interview form containing open-ended questions was used in the study in order to determine the reasons why Syrian students learn Turkish, their perceptions of Turkey and expectations from the future. The first part of the form, which was composed of two parts, included questions aimed at obtaining demographic information about the participants, whereas the second part included nine open-ended questions prepared with view to collecting data from the participants in accordance with the objectives of the study. Prior to the preparation of the interview questions, first, relevant studies were examined and a question pool was created. In the second stage, the question pool thus prepared was submitted to two experts for their opinions, one in the Department of Turkish Education and the other in the Department of Sociology, both at a state university. Based on expert opinions, a "structured interview form" was prepared.

The form prepared in order to ensure the content validity of the interview form was submitted to the evaluation of the experts who teach Turkish as a second language to Syrians. The interview form was given its final form in accordance with the feedback received. For the reliability of the form, consistency of the participants’ views was and the results of the data obtained were shared with the people who participated in the study.
The questions in the interview form are as follows:

1. Why do you learn Turkish?
2. What is the first thing that comes to your mind when Turkey is mentioned?
3. Do you like living in Turkey?
4. Would you like to live in another country? If your answer is “Yes”, where would you like to live?
5. What are the things that you have difficulty in coping with in Turkey?
6. What would you like to do after you graduate from university?
7. Do you think you will be employed in the field that you graduate from?
8. Do you plan to go back to your country?
9. What are your expectations from the future?

Since the data were collected by interview form, descriptive analysis method was used in the analysis of the data. According to the descriptive analysis, the data are summarized and interpreted according to the previously determined themes. The data can be organized according to the themes raised by the research questions or presented by considering the questions or dimensions used in the interview and observation processes. Direct quotations are often included in the descriptive analysis to reflect strikingly the views of the individuals interviewed or observed" (Yıldırım & Şimşek, 2018, p. 239).

**FINDINGS**

**Why did you/are you learn/learning Turkish?**

The first question asked to Syrian students within the scope of the research has been "Why did you/are you learn/learning Turkish?" When the answers of the participants were examined, it was seen that 66 students answered this question under 144 different codes. The frequencies and percentages of the codes of the participants' opinions regarding the first question are as follows:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why did you/are you learn/learning Turkish?</td>
<td>To pursue higher education</td>
<td>57</td>
<td>39.5</td>
</tr>
<tr>
<td></td>
<td>To speak Turkish in daily life</td>
<td>35</td>
<td>24.3</td>
</tr>
<tr>
<td></td>
<td>To find a job</td>
<td>21</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>To become a Turkish citizen</td>
<td>18</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>To eliminate communication problems</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>144</td>
<td>100</td>
</tr>
</tbody>
</table>

The reason for 39.5 percent of the participants to learn Turkish is “to pursue higher education”. This is followed by "speaking Turkish in daily life", "finding a job", "becoming a Turkish citizen" and "eliminating communication problems".

Some of the opinions of the participants regarding the reasons for learning Turkish are as follows:

(K2) "I had to quit my university education in Syria. I had to learn Turkish in order to continue my education in Turkey. For this, I started learning Turkish. Also, I had to speak Turkish on the street." (K17) "After I arrived to Turkey, I wanted to begin attending the university and the first thing I did was to learn Turkish." (K29) "I am an engineer. Finding a job was very important for me, but it was very difficult for me to find a good job as I didn't
speak Turkish. If you don’t know the language, being an engineer does not matter much.” (K30) "I speak English and some German. However, most people in Turkey do not speak foreign languages. That’s why we often have communication problems.” (K35) "I wanted to study at university and become a Turkish citizen. In order to do that, I had to learn Turkish.” (K38) "I am an outgoing person. I always want to communicate and get to know the people around me and my neighbors. For this reason, being able to speak Turkish in daily life was the most important need for me.” (K44) "When I came here, thanks to my acquaintances, I started working as an Arabic-English translator in an office. The company I worked for was an Arab firm that won big tenders abroad. Later, they began to take jobs in Turkey and I had to learn Turkish as well. I also lived Turkey and I had to learn this language.” (K59) "Initially, I tried to get in a major that was taught in English, but I was not successful. When I got in a scholarship for a major that was taught in Turkish, I first went to TÖMER and then I started attending classes at my faculty. Now, I can speak Turkish fluently.” (K62) "I learned Turkish to communicate with Turks, to study at university and to have a nice profession.”

Findings concerning the question “What is the first thing that comes to your mind when ‘Turkey’ is mentioned?”

The participants were asked the question “What is the first thing that comes to your mind when ‘Turkey’ is mentioned?” as the second question on the interview form. 29 different themes were obtained based on the responses given by the participants. While twenty-six of the themes are positive, three are negative. The frequencies and percentages of the codes belonging to the participants’ views regarding the second question are given in Table 3:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>14</td>
<td>14.7</td>
<td></td>
</tr>
<tr>
<td>Civilization</td>
<td>12</td>
<td>12.6</td>
<td></td>
</tr>
<tr>
<td>Beauty</td>
<td>8</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>6</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>Fraternity</td>
<td>6</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>5</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Tourism</td>
<td>5</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>4</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Homeland</td>
<td>4</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Ottomans</td>
<td>4</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Comfort</td>
<td>3</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Life</td>
<td>3</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>3</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Istanbul</td>
<td>2</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Justice</td>
<td>2</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Ataturk</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Challenges</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Democracy</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Freedom</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Future</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Hatred</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Hospitality</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Mercy</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Peace</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Racism</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Stability</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Turkish</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>1</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>95</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Frequencies and percentages relating to the codes of the question “What is the first thing that comes to your mind when ‘Turkey’ is mentioned?”
As far as the second question was concerned, responses of the sixty-six participants were examined and 95 different codes were obtained. “Nature” comes to the minds of 14.7% of the participants when Turkey is mentioned. 12.6 percent of the participants recall “civilization” when Turkey is mentioned, whereas 8.4 percent of them recall “beauty”, 6.3 percent “education” and 6.3 percent “fraternity”. The codes “history, tourism, homeland, food and Ottoman” are the major words that come to mind when Turkey is mentioned. The codes racism, hatred and challenge, which were obtained by an examination of the participants’ views, are noteworthy in that they are codes that have negative meanings. Some of the participants who expressed positive views stated their opinions in the following terms:

(K5) "Turkey is a beautiful country of good people. It is good to be living in Turkey because there is religious freedom and also, we can continue our education." (K7) "When Turkey is mentioned, I remember civilization, economic growth, rapid development and political independence." (K8) "Turkey is the best place on earth and plus baklava." (K10) "Democracy, justice and education." (K11) "Turks are our brothers." (K14) "Turkey is a developed and beautiful country." (K15) "People's compassion, love, hospitality, and the country's rich history and natural beauty." (K17) "The glorious Ottoman state." (K18) "The country that is honestly siding with us." (K23) "A country that has rapidly developed within a short time and a very beautiful nation." (K24) "I remember kind-hearted people full of sincerity who I adore." (K29) "The country where I live today and I am very close to my country." (K30) "My second home." (K32) "Islamic history and civilization." (K33) "Ottoman Empire and Sultan Abdülhamit." (K38) "A country that brings Eastern and Western civilizations together and is rich in terms of civilization." (K46) "I am a computer engineer and work as an expert in companies. My average was quite good as of the end of last month. This provided me with the opportunity to travel in Turkey and visit different places. Above all, it is a country known for its natural beauty and history." (K53) "A beautiful country of tourism enjoying good universities." (K54) "A safe country and also a homeland for refugees." (K57) "My future country." (K60) "Turkish language, its natural beauty, Ataturk, Istanbul and tourism." (K61) "Tea and the Ottoman Civilization."

The views of the participants with codes that had negative meaning are as follows:

(K42) "It is a beautiful country but it will be hard to live here and you need to endure in order to face the challenges." (K58) "Turks' racism and their xenophobia, especially towards Arabs."

**Findings concerning the question "Do you like Turkey?"**

The participants were asked the question "Do you like Turkey?" as the third question on the interview form. All of the participants responded to this question. The percentages concerning the responses given by the participants to the question are as follows:

**Figure 1. The percentages of the participants like Turkey**

Large numbers of people have been forced to migrate to Turkey due to the conflict in Syria. The situation holds true for the 66 participants who participated in the study. 97 percent of the participants stated that they liked Turkey while 3 percent stated that they did not like Turkey.
People who like Turkey are trying to establish a new life here. To this end, they make concerted efforts to improve themselves both educationally and culturally and adapt to the society around. The two people who stated that they did not like Turkey are receiving their education in Turkey and trying to organize their lives. When these people, who were forced to leave their country in a psychologically devastated manner owing to the war, face unfavorable treatment when they come to Turkey, they cannot help but produce reactions and these reactions affect people's emotions.

Findings concerning the question “Would you like to live in another country? If your answer is ‘Yes’, where would you like to live?”

The participants were asked the question “Would you like to live in another country? If your answer is ‘Yes’, where would you like to live?” as the fourth question on the interview form. 24 of the participants answered the question “Yes”, while 41 responded “No”. Due to the fact the participant with number forty-eight (K48) responded to this question as “I like Turkey, or else when my country is safe, I can live in my country.” this view was not included in the “yes-no” categorization. The views of two of the participants who answered the question as “no” are as follows:

(K32) “I like Turkey. I come from a family of Turkmen origin and I do not like any other country.” (K46) “I have not considered traveling outside of Turkey.”

The participant number sixty-three (K63), responding “I just do not want Turkey.”, pointed out that s/he wanted to live in another country, no matter what country it was and that his/her only wish was to live in a country other than Turkey. Since the participant number sixty-three did not name a country, his/her response is not included in the table below.

Statistical data belonging to the countries where the participants who responded to the question as "Yes, I would like to live in another country." are as follows:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries where the participants want to live</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>5</td>
<td>21.7</td>
<td></td>
</tr>
<tr>
<td>Dubai</td>
<td>4</td>
<td>17.3</td>
<td></td>
</tr>
<tr>
<td>Istanbul</td>
<td>4</td>
<td>17.3</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>2</td>
<td>8.6</td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Netherland</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Qatar</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Syria</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Of the responses of the 23 participants who stated “I would like to live in another country.”, Canada stands out as the country where people wanted live most (21.7%). Located on the northernmost tip of the North American continent, Canada is the second largest in the World in terms of total area. Canada is followed by Dubai, preferred by 17.3% (4 persons) of the participants. Dubai is one of the seven emirates constituting the United Arab Emirates.

Although the interview form contained the term “country” and the form was prepared bilingually, namely in Turkish and Arabic, 4 of the participants specified the place where they wanted to live as Istanbul. Likewise, 1 participant wrote their preferred place of living as “Europe” in the interview form rather than naming a country. Based on this, it could be inferred that this person would like to live in any European country no matter what country it was.
2 of the participants stated that they wanted to live in the USA. Netherland, England, Spain, Qatar, Russia and Saudi Arabia were specified in the form, each by 1 participant. When the countries where the participants want to live are examined, it is observed that they prefer prosperous countries with high living standards. One of the participants, on the other hand, stated that s/he wanted to live in Syria, his/her own country.

**Findings concerning the question "What is the most challenging thing for you in Turkey?"**

The participants were asked the question “What is the most challenging thing for you in Turkey?” as the fifth question on the interview form. The frequencies and percentages of the codes belonging to the views of the participants concerning the fifth question are given in Table 5:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>32</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Finding a job</td>
<td>8</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Racism</td>
<td>8</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Discrimination</td>
<td>6</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Adaptation problem</td>
<td>5</td>
<td>6.25</td>
<td></td>
</tr>
<tr>
<td>Admittance to university</td>
<td>3</td>
<td>3.75</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>2</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Getting an ID card</td>
<td>2</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>2</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Accommodation</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Legal procedures</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Life</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Longing</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Low wages</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Obtaining a travel permit</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Obtaining work permit</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Proving marriage</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Rental</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Vehicle</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Working hours</td>
<td>1</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

2 of the participants stated that there was nothing challenging for them in Turkey. 20 different codes were obtained as a result of an examination of the responses of the remaining 64 participants.

When all of the participants were considered, it transpired that “language” was the most challenging thing for them. The participants reported that when they first arrived in Turkey, they could not communicate with local people as they did not know any Turkish and hence had a lot of difficulty in daily life. The views of some of the participants concerning the code “language” are as follows:

(K8) "Speaking and language." (K10) "Since there are different dialects, I sometimes have difficulty understanding them." (K13) "Communication problem." (K14) "It was rather difficult to find a job and learn Turkish before I entered university." (K15) "When I first arrived, I experienced problems with language but I was able to adapt after I learned the language." (K26) "Language and differences in lifestyle." (K29) "First and foremost, language and communication. Sometimes, harassment by some people." (K38) "Initially, it was hard to communicate with others as I did not know Turkish."

The issues that the participants found the most challenging after the language problem concerned “racism”, “finding a job” and “discrimination”. 10% of the participants cited views
regarding racism, 10% regarding finding a job and 7.5% regarding the code discrimination. The participants' views concerning discrimination and racism are noteworthy in that they are in general quite similar. Some of the participants reported that they were discriminated against whereas some others went further than that and stated that the discrimination they faced sometimes reached a level of racism. Some of the views of the participants concerning the three codes are as follows:

(K5) "There is the question of adaptation between Turks and Syrians and sometimes we are subjected to racism." (K18) "The Turkish society does not accept us." (K20) "Language and racism, which is sometimes displayed against Syrians." (K30) "When a bad Syrian does something wrong, some people within the Turkish society act as if everybody were like that." (K44) "Racism based on ignorance, for you cannot tell the reality to those who commit such kind of racism." (K57) "I have no rights in Turkey because I am a Syrian." (K46) "When I came from Syria, my Turkish was not good. Although I am a computer engineer, I worked as a porter with Turks for a year." (K58) "People and they also share us low wages." (K65) "Obtaining a legal work permit."

Other views that the participants stated concerning the issues that they found the most challenging in Turkey are as follows:

(K6) "People embrace Syrians but voracious landlords demand extortionate rentals from us. It is quite hard to travel to another city in Turkey using temporary protection ID cards. I cannot even start a small business on account of high taxes in Turkey." (K7) "Legal procedures are too many. Civil servants may practice according to their whims." (K32) "Some Turks behave kind of vainly. But others love everyone and behave respectfully by virtue of the very nature of Anatolian people."

Findings concerning the question “What would you like to do after you graduate from university?”

The participants were asked the sixth question on the interview form, namely "What would you like to do after you graduate from university?" The frequencies and percentages of the codes belonging to the participants’ views concerning the sixth question are as follows:

Table 6. Frequencies and percentages belonging to the question “What would you like to do after you graduate from university?”

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entering into working life</td>
<td>37</td>
<td>52.1</td>
<td></td>
</tr>
<tr>
<td>Master’s</td>
<td>9</td>
<td>12.6</td>
<td></td>
</tr>
<tr>
<td>Contributing to Turkey</td>
<td>7</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>Working in the relevant field of expertise</td>
<td>7</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>Launching a project</td>
<td>2</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Going back to Syria</td>
<td>2</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Being a painter</td>
<td>1</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Doctorate</td>
<td>1</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Doing academic studies</td>
<td>1</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Founding a laboratory</td>
<td>1</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Going abroad</td>
<td>1</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>No answer</td>
<td>1</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Opening a clinic</td>
<td>1</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>71</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

52.1% of the participants want to enter the working life. This figure is noteworthy as a rather high rate. The reason why the rate is so high is that the participants’ economic status is not so good and therefore they are obliged to begin working to support their family. Only 12.6% of the participants want to pursue their master’s degree and continue their education after graduation. Although following higher education is important for their personal development, the priority of the participants is to
graduate and find a job. The views of the participants regarding the code “Entering the working life” are as follows:

(K6) "I will find myself a suitable job." (K11) "I will start teaching." (K14) "I will work in a health institution." (K15) "I want to find a job and work and contribute to this country." (K24) "I am thinking of working in the translation-interpretation sector." (K41) "I want to do my master's degree and start my own business in Turkey." (K55) "I want to work in a hospital." (K59) "I want to find a job and start a small project."

9.8% of the participants expressed the view regarding the code “contributing to Turkey” and again 9.8% expressed the view regarding the code “working in the relevant field of expertise”. The views of the participants who wanted to contribute to Turkey are as follows:

(K17) "I will try to increase the level of the society by playing the role required by my level of education." (K21) "I want to work in Turkey." (K23) "I will continue to live in this country and be a beneficial person for this country." (K29) "I want to obtain my diploma equivalence and work in Turkey." (K32) "I want to enlist in the Turkish army because I love this country." (K40) "I want to enter the workforce and serve this country, which has accepted us." (K45) "I want to work in Turkey and serve the great Turkish nation, who has accepted us."

Some of the views of the participants who wanted to work in their field of expertise are as follows:

(K33) "Working in my field of graduation." (K38) "I want to work in my field of expertise." (K39) "I want to work in my own field." (K44) "Improving myself in the same field and returning to Syria. If I can't return, it is highly likely that I will stay in Turkey."

Views of some of the other participants are as follows:

(K28) "I want to launch a small project." (K42) "I have many dreams. First, I want start a laboratory specifically developed for myself and work with well-known dentists. I want to invent new things in my profession." (K64) "I want to raise a consciousness of civil society and non-governmental organizations and found a university. Of course, I want to realize all of this in Turkey."

Findings concerning the question "Do you think you will be able to work in your field of graduation?"

As the seventh question on the interview form, the participants were asked "Do you think you will be able to work in your field of graduation?" The frequencies and percentages of the codes belonging to the views of the participants about the seventh question are given in Table 7:

<table>
<thead>
<tr>
<th>Code</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>49</td>
<td>74.2</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Perhaps</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>I do not know</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>100</td>
</tr>
</tbody>
</table>

74.2% of the participants think that they will be able to work in their field of graduation. Some of the views of the participants who responded “yes” to this question are as follows:
"Yes I do, if the war in my country ends or if I am granted Turkish citizenship." (K35) "Yes I do; indeed, I have already founded a private business." (K42) "Not as soon as I graduate I think, but in the end, I will work and my dreams will come true." (K46) "Yes I do, but I need to be patient." (K64) "Yes, I will open a scientific research center."

9% of the participants think that they will not work in their field of graduation. 4.5% of the participants responded “perhaps” and 3% responded “I do not know”. The responses given by 9% of the participants were included in the code “other”. The views of these participants are as follows:

(K14) "We have a low possibility." (K26) "I hope so." (K30) "If there is no Turkish citizenship, finding a job will be difficult." (K32) "God willing! I really like helping others. If I have an adequate salary, then it will be normal for me to work." (K44) "Job opportunities in Turkey are unfortunately limited." (K53) "I need to get a diploma equivalence first."

Findings concerning the question “Are you thinking of returning to your country if life returns to normal in your country?”

The participants were asked the question “Are you thinking of returning to your country if life returns to normal in your country?” as the eighth question on the interview form. The frequencies and percentages of the codes belonging to the participants’ views regarding the eighth question are given in Table 8:

Table 8. The frequencies and percentages regarding the codes of the question “Are you thinking of going back to your country if conditions turn to normal in your country?”

<table>
<thead>
<tr>
<th>Code</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>22</td>
<td>33.3</td>
</tr>
<tr>
<td>No</td>
<td>35</td>
<td>53</td>
</tr>
<tr>
<td>Perhaps</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>I do not know</td>
<td>5</td>
<td>7.5</td>
</tr>
<tr>
<td>I am undecided</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>100</td>
</tr>
</tbody>
</table>

33.3 percent of the participants stated that they would go back to their country if conditions turn to normal. The views of the participants thinking of going back to their country are as follows:

(K24) "If life returns to normal, be sure everybody will return and I will be the first to return." (K33) "Of course I am. My city is Homs. I really love it and I miss it a lot. The atmosphere there was like the one in Turkey. My city is the one where Halid Bin El Velid, a companion of Prophet Muhammad hails from and the second largest Muslim cemetery is there. I love Homs as much as I do Istanbul." (K56) "Yes I am, but not immediately." (K63) "Certainly, my country will remain as the best." (K64) "Of course, but I will be at the service of both Turkey and Syria. Now, I have two homelands."

53 percent of the participants stated that they would not return even conditions turn to normal. Some of the participant views are as follows:

(K42) "I may return to Syria only for a visit." (K46) "If I have a permanent job, I will not return." (K55) "No, because I have completed my education in Turkey and I will work in Turkey. How I might return to my country under the circumstances!" (K58) "Of course, but I will go for visitation." (K48) "I would return for the sake of my family and friends but if they are with me in Turkey, I won't return."

3 of the participants answered “perhaps”, 5 answered “I don't know” and 1 answered “I am undecided.”
Findings concerning the question "What are your expectations from the future?"

The participants were asked the question “What are your expectations from the future?” as the ninth question on the interview form. The frequencies and percentages of the codes belonging to the participants’ views regarding the ninth question are given in Table 9:

Table 9. Frequencies and percentages regarding the codes of the question "What are your expectations from the future?"

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are your future</td>
<td>A beautiful life</td>
<td>16</td>
<td>17.5</td>
</tr>
<tr>
<td>expectations?</td>
<td>Success</td>
<td>14</td>
<td>15.3</td>
</tr>
<tr>
<td></td>
<td>Peace</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Job</td>
<td>8</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>Stability</td>
<td>6</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>Citizenship</td>
<td>5</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>Future</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>Adaptation</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Freedom</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Staying in Turkey</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Higher Education</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Money</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Going back to Turkey</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Tranquility</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Graduation</td>
<td>1</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>Hope</td>
<td>1</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>Justice</td>
<td>1</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>Learning Turkish</td>
<td>1</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>Marriage</td>
<td>1</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>Understanding</td>
<td>1</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>91</td>
<td>100</td>
</tr>
</tbody>
</table>

When the responses of the participants were examined, 22 different codes were obtained. Of the codes that emerged as a result of an examination of the participants' views, the one with the highest rate is the code “a beautiful life” (17.5 percent). Millions of people have migrated to different countries abandoning their homes, relatives and homeland due to the conflict in Syria and their lives and routines have been upset. Therefore, people's expectations for the future took the form of having a beautiful life. Similar to the code “a beautiful life”, the codes “tranquility”, “stability”, “peace”, “success” and “security” attract attention as codes reflecting people's desire to put their lives in order.

(K3) "I haven't given it a thought. But I think we will have a beautiful life and find a good job." (K8) "Beautiful days and nothing more." (K11) "A tranquil and peaceful life." (K14) "If only I had a more stable life." (K15) "A tranquil life, endless achievements and let peace prevail everywhere." (K20) "What I expect for the future is for God to bless our country with victory, compassion of our martyrs and release of our brethren from prisons." (K22) "Let beautiful days prevail and that is enough." (K24) "Living in security." (K26) "Reconciliation and success." (K32) "I want tranquility and peace by the will of God and my family." (K34) "Success; I wish for Syrians and the whole Arab world to have peace." (K40) "Being successful, making accurate decisions, and possessing a strong willpower." (K45) "Being successful in Turkey." (K46) "A beautiful life away from the politics and its effects." (K52) "I wish for peace, security, justice and success." (K54) "Elimination of ignorance and cessation of the war." (K56) "First and foremost, a good and danger-free life and freedom of thought." (K60) "We should all struggle to make the world a safe place and develop our country." (K63) "Putting an end to wars, murderers and hunger and returning to our country." (K66) "I would like to be a more distinguished person in the field I am studying."
8.7 percent of the participants want to find a good “job” in the future and work. The participants’ views concerning the code "job" are as follows:

(K5) "Graduating from university and finding a permanent position. In addition, I would to complete an MA and a PhD." (K39) "Living in a proud manner, finding a job and staying in Turkey." (K41) "I want to find a job. A life where wars and racism do not exist. I want to get married and have a family."

5.4 percent of the participants stated that they wanted to be Turkish citizens in the future:

(K23) "Being a citizen of this country and work for it." (K30) "A better economic and social future and we can't wait to see a better integration with the Turkish society." (K33) "Above all, being a Turkish citizen." (K35) "Being a Turkish citizen and starting a big business in Turkey and in the world." (K59) "Learning Turkish well and being able to live as a member of the Turkish community."

The participants' other views concerning their expectations for the future are as follows:

(K2) "Making a lot of money." (K6) "Adapting to all areas of life in Turkey and attaining a psychological and physical balance." (K7) "One day I will return to my city and rebuild my home. I want to start a private business between Turkey and Syria." (K18) "That the Turkish community should realize that we are brothers and that we came here at the point of the bayonet; not to grab their jobs." (K28) "Our lives in Turkey being easier." (K29) "Being able to work legally in turkey and getting an MA." (K31) "Freedom for my country and working in my preferred field." (K38) "The future looks bright, so I am optimistic and I am expecting a large portion of the future." (K42) "I want my voice to be heard across the world and leave my mark in the world." (K43) "An environment where everyone can work humanely and reaching the pinnacle of my career." (K47) "Good things, no matter what they are." (K64) "I don't expect anything for the future; let it expect things for me. Keep fighting" (K65) "Working for the future as if one will live eternally."

**DISCUSSION, CONCLUSION AND RECOMMENDATION**

The incidents that began in Syria led the country into a civil war and this resulted in dramatic changes in Syrian people’s life. “In general, those Syrian who were obliged to leave their homes sought refuge in neighboring countries and took shelter in countries such as Lebanon, Jordan, Turkey, Iraq and Egypt. The crisis, which started in March 2011 and is still having its impacts felt on a large area, has caused more than 200,000 people to lose their lives and millions of other people to abandon the places where they used to live. In this sense, it could be said that more than 10 million people have been seriously affected by the crisis” (Öztürk and Çoltu, 2018, p. 189).

“While most of the Syrians chose to stay in the Middle East, about 1 million of them went to Europe. Turkey, on the other hand, was the country that received the highest number of Syrians” (Sputnik Turkey). 25% of the nearly three and a half million Syrians who came to Turkey are within the 15-24 age range, which is called young population. Of these people, especially those of the higher education age, experienced problems in following their education when they arrived in Turkey and indeed many of them had to leave aside their academic past in Syria and begin university all over again. In particular, determining the reasons why the young Syrians who are at their era of clutching on to life learn Turkish, their perceptions of Turkey and expectations from the future holds significance in regards to the proper administration of their process of learning Turkish as a second language and proper planning of the future of the Syrians.

Considering the field of teaching Turkish as a second language to immigrants, it is seen that the curriculum lacks of qualified instructors and materials; assessment and evaluation processes vary from institution to institution; It is seen that there is no coordination and standard among institutions.
that teach Turkish to immigrants (Başar, 2020, p. 307-309). In order to eliminate the problems, the language learning needs of Syrians who learn Turkish as a second language should be determined correctly.

The reason for 39.5 percent of the participants to learn Turkish is “to pursue higher education”. All of the participants were Syrian students attending higher education in Turkey. For this reason, it is normal for their primary aim of learning Turkish to be attending higher education.

“It is known that not speaking Turkish delays the adaptation of immigrants to Turkish society and creates certain social problems” (Başar, 2020, p. 296). Indeed, 24.3 percent of the students want to be able to speak Turkish in daily life. When people settle in a different country due to immigration, it is very difficult for them to adapt to the social life without knowing the language of that country. Bölükbaş (2016, p. 30) states that while describing the problems that Syrians face in particular, performing an official transaction, filling out a form, writing an e-mail, telling the doctor about their health problems in the hospital, communicating with their Turkish friends, shopping and asking for addresses, they have problems. For Syrians who want to meet their basic needs, education, find a job, work and continue their lives, learning Turkish and overcoming communication problems that can be experienced in daily life are important reasons for learning Turkish. Phutkaradze (2018, p. 88) states that the fact that irregular immigrants do not know the language of the society they live in, affects their business life negatively, and states that these people need to learn the official language of the country in order to continue their lives normally. As a matter of fact, 9 percent of the participants stated, in a way that supports this situation that they wanted to learn Turkish in order to “eliminate communication problems According to Tunagür and Kardaş (2021, p. 135), Syrians learn Turkish in order to live in Turkey, receive a decent education and adapt to social life.

“Finding a job” and “becoming a Turkish citizen” are among the other reasons the young Syrians want to learn Turkish. People have to produce, work and earn income in order to survive. People who do not know the official language spoken in the country usually work under difficult conditions in the service sector as a cheap labor force. The higher education diplomas do not help in increasing their income. Therefore, the Syrians who immigrating Turkey, would like to learn Turkish and get higher education, and also expect to take part in different sectors as qualified employees. The exceptional right to "become a citizen" granted to Syrians attending higher education, causes an increase in the demand of the young Syrian population to learn Turkish and to receive higher education.

The relationship between Turkey and Syria is not new. Though it dates back to earlier times, the borders between the two countries were drawn with the Ankara Treaty and they assumed their final form when the State of Hatay was annexed to Turkey. With the demarcation of the borders, many families were split and while a part of the family remained on Syrian territory, the other part remained on the Turkish side. Ties established for reasons of kinship, trade, marriage etc. have caused both people and cultures to resemble each other. Today, the mention of the word “Turkey” brings concepts of nature, civilization, fraternity, education, history, tourism, Ottomans, homeland and food to the minds of the Syrian immigrants of higher education age. These people live with us within the borders of Turkey today. However, it should be keep in mind that the people in the region lived their lives in the same territory during the Ottoman rule. Therefore, it is not surprising that young Syrians remember the concepts when the word “Turkey” is mentioned.

Almost all of the young Syrians living in Turkey love Turkey. Large numbers of Syrians migrated to Europe as a consequence of the incidents in Syria, but these people often experienced serious problems in adapting to the countries where they took refuge. Especially, the Syrians who migrated to countries that had a different religion from them, initially had enormous difficulty. Cultural similarities between Turkey and Syria make young people feel at home and love Turkey. The proximity of Syrians to Turkey generally affects their willingness to learn Turkish in a positive way. On the other hand, Tunagür and Kardaş (2021, p.) revealed in their research that only two students
wanted to learn Turkish because they love Turkey, and stated that it is thought-provoking that Syrians who have been living in Turkey since 2011 do not have the expected level of love for Turkish.

Although most of the Syrian young people state that they love Turkey, 36% of the young people wish to live in another country especially due to the possibility of having better living standards there. According to Şimşek (2019, p. 507), behind the Syrians’ decision to go to Europe, there are mostly problems related to access to basic rights, including employment, education, health and housing.

The Netherlands, Spain, England, Canada, Qatar, Russia, Saudi Arabia and Dubai, the United Arab Emirates, stand out among the countries where young people wish to live. These young people also state that they wish to live in the American continent. When the countries where the young Syrian population in Turkey wish to live are examined, it is seen that countries with higher living standards and welfare are preferred. It is not easy for young people to migrate to those countries after Turkey, because most of these countries object to accepting legal immigrants or accept only a few applications for asylum each year. Syrians trying to enter those countries object to accepting legal immigrants or accept only a few applications for asylum each year. Syrians trying to enter those countries in secret experience problems in the process and indeed many people risk their lives in this process.

“Negative and discriminatory perceptions about Syrians and media representations that contribute significantly to the production and spread of these perceptions are among some of the problems encountered by Syrian refugees in the host countries. The way Syrian refugees is represented in the media causes the problem to prolong and spread” (Efe, 2015, p. 7). The Syrian young people face similar hardships in Turkey, too. “Fake news such as that Syrian refugees can attend any university they want without limitations of quota; the state pays them 1500 TL a month and they can receive all health services including IVF treatment for free is being spread by anti-immigrant groups without encountering any counter arguments in an environment where accurate information is at a minimum level or nonexistent at all; accounts, websites and Facebook pages in the social media established specifically for disinformation continue to spread false information systematically” (Özipek, 2018, p. 66). Hatred speech and negative discrimination faced by Syrians in particular are unacceptable behaviors. In some cities, attitudes of local people sometimes even reach levels that could be deemed racism and Syrians experience social exclusion (See, Cengiz, 2015; Evran, et al., 2020; Çağlar et al., 2016; Karasu, 2016). It should be noted that these people did not come to Turkey by their own will. The conditions they found themselves in compelled people to migrate. Indeed, 33.3% of the young people wish to return to their country if life returns to normal there. Though this rate may seem low, an evaluation based on the age of the participants will provide a healthier analysis of the situation. Most of the young people who participated in the study came to Turkey at a very early age. Therefore, although feelings of belonging to their own country have not yet fully taken root, 1 out of the 3 participants stated that they wanted to return to their country. Nevertheless, the fact that these young people are going to complete their education in Turkey is another factor that will make their enthusiasm to live in Turkey. It is certain that as the mean age of Syrian people increases, the rate of people wishing to return to their country will also increase.

Problems concerning language, education, finding a job, adaptation, getting into university and obtaining an ID card are among the other challenges that Syrian young people face in Turkey. Except for those of Turkmen origin, the most challenging problem that people coming from Syria face when they arrive in Turkey is language. Because of language problem, people have difficulty in communication, their education is disrupted and adaptation problems arise. People have difficulty finding jobs in line with their education as they do not speak the local language and hence are generally obliged to work in jobs requiring physical strength for rather low wages. Moreover, “rising rates of unemployment in places where Syrian population is dense lead to perceptions that Syrians take jobs that could otherwise be done by native people” (Özpınar et al., 2016, p. 4). Syrian students also face some problems in their Turkish teaching processes. Tunagür and Kardaş (2021, p. 132) group the difficulties that Syrian students experience while learning Turkish under seven themes: language skills, social relations, cultural adaptation, alphabet difference, linguistic characteristics, personal reasons and vocabulary.
Syrian families in Turkey stay either in the camps prepared by the state or in the houses they rent. Though efforts are constantly being made to improve the conditions in the camps, it is impossible for people to find the comfort of their homes. Families that are a little better off prefer to rent houses rather than stay in camps. However, “increases have been observed in house rentals and prices since Syrian refugees began to arrive in Turkey” (Özdemir, 2017, p. 123). Both the rise in demand and the desire to earn more have led to dramatic increases in rentals in cities with high immigration rates, which has negatively affected both Syrian and Turkish families. Koç et al. (2015, p. 84) also stated that the number of people who want to stay out of the camps is increasing day by day, and it was welcomed that these people put the money they brought with them into the local market in the first place, but in the next period, especially in border cities, rent increases were experienced and the increases negatively affected the tenants.

Syrians allowed into Turkey are granted temporary protection status and ID cards and these people can travel within the country only after they obtain permission to this end. Therefore, Syrians first need to have a reason for traveling from one place to another, and then they need to get permission for travel from the immigration authority. Though this is important for keeping the balances within the country and maintaining an even distribution of Syrians to cities, the practice makes the lives of Syrian people more difficult.

52.1 percent of the young people are planning to finish their university education as soon as possible and get a job immediately. The most important factor in this is that these people have families depending on them and they need to make a living. Only 12.6% of the young people wish to pursue a master's degree, i.e., continue higher education. Researches also reveal that Syrians have priorities in finding a job (see Arslan, 2018; Korkmaz, 2018; İşcan & Çakır, 2019). Here, it turns out that the priority of the young people is to find a job. 9.8 percent of the young people stated that they wanted to engage in activities that would benefit Turkey after they graduated. The fact that Turkey embraced them in their hard times causes these people to feel indebted to Turkey and therefore do favorable things for Turkey.

Admission of foreign students at higher education level in Turkey into university depends on certain criteria. According to this and contrary to the common belief, foreign students compete only with foreign students like themselves, and those who are successful as a result of the evaluations gain the right to enroll in the relevant department of the universities. While general standards for foreigners' entrance to university are the same in all universities, different universities can implement different procedures with slight changes. While some universities admit students with their own examinations, others accept scores obtained from foreign student examinations administered by one of the major universities and allow students to enroll. When the distribution of Syrian youth to the departments of universities is examined, it is seen that medicine, dentistry, nursing, architecture and engineering come to the forefront. 74.2 percent of the youth think that they will be able to work in their field of expertise. This high rate is attributable to the fact that young people generally prefer occupations that are on high demand and are in the service sector.

People living as Syrian citizens in temporary protected status in Turkey do not have the legal right to travel to many European countries. Outside of exceptions, many countries have closed their doors to Syrian citizens. Therefore, knowing that they cannot go any other country with their Syrian passports, young Syrians want to become Turkish citizens. If they become citizens, the lives of these young people will be easier and they will be able to fully benefit from the rights that Turkish citizens enjoy.

Syrian refugees are a fact of the whole World. Turkey did not act as a mere spectator to the events taking place right beside it; instead, it opened its doors to people rushing desperately to it. According to international agreements, many European countries are required to accept a certain number of Syrian refugees to their country in proportion to their level of development. Yet, “according to Oxfam, only three rich countries pledged to accept Syrians in proportion to their economic size.
According to the report, these countries are Canada, Germany and Norway” (BBC News, 2016). Other countries, on the other hand, tend to admit as few Syrians as possible and ignore the problem.

Analyzes based on the responses of the Syrian youth participating in the study indicated that the Syrian youth still continue to struggle for their lives. These young people are struggling to learn the local language, get higher education, find a job and sustain their lives and expect security, peace, stability and success from the future. Young Syrians want to leave their bad days behind and look to the future with hope. In this context, all countries must accept their responsibility and a common road map should be determined for the solution of the problem.

Young people are the most important part of the population that will influence and direct the history of nations and states. Syrian youth who had to migrate to Turkey was forced to face the challenges of life at an early age. Most of the young Syrian people want to live a nice life where they can leave the bad days behind. The war, which underlies the hard times they have experienced, has inflicted a great trauma on the youth. For this reason, the Syrian youth wants all wars to come to an end so that peace will prevail all over the world.

The suggestions put forward based on the results of the research are as follows:

• The Syrian students who had to abandon their education and migrated to Turkey need to be granted the right to transfer to the related departments of the universities in Turkey, and they need to be able to complete their remaining courses and graduate from their departments.

• Regardless of the language of instruction of their departments, the students who are admitted to the universities should be admitted to preparatory Turkish classes and be made sure they learn Turkish.

• Considering that they will continue their higher education after TÖMER, beginning from the advanced level, the Syrian students who learn Turkish as a second language should be given academic Turkish courses.

• Syrians who learn Turkish in order to organize their social life and adapt to Turkish society should be provided with learning environment where they can practice the language they learn and socialize with their peers; various events and organizations should be organized.

• Those who have successfully completed the higher education process should be given the right to become a Turkish citizen; these people should be encouraged to pursue MA and PhD; in particular, following the branches that will be made among the students who graduated from departments such as medicine, pharmacy, dentistry, engineering, architecture, nursing, it should be ensured that the best ones among them start to work in the relevant institutions.

• Incentive programs that would eliminate the idea of migrating to other countries from the minds of accomplished young Syrians who are developed in the professional and academic sense and those people should be provided with projects and employment opportunities that would benefit Turkey and themselves.

• Institutions teaching Turkish as a second language should be coordinated, curriculum, textbooks and materials for teaching Turkish as a second language should be developed, language teaching principles should be built on certain foundations and inter-institutional standardization should be ensured.
• Physical conditions of the Turkish courses being held in the camps (heating, lighting, etc.) should be improved; technological tools such as computers, projectors, and sound systems should be provided and made available to the service of course centers. Instructors who will take part in the courses should be chosen among those who are experts in the field of teaching Turkish as a second language. If there is no such opportunity, instructors from the departments related to the field such as Turkish teaching, Turkish language and literature should be assigned to the courses. Instructors charged with in-service training programs should be provided with opportunities to meet with academics who are experts in their fields and to improve themselves.

• Classes should be held in mixed classes at TÖMER institution, and not all students should be Syrians as they would like to speak Arabic among themselves. In this way, Syrian students should be encouraged to use Turkish in order to communicate with people coming from different countries.

• If possible, special groups should be created for Turkmen students, and these students should gain the competence of writing in Turkish alphabet and speaking in Istanbul Turkish.

REFERENCES


Cengiz, D. (2015) Spatial effects of forced migration and perception of local people: Kilis example. Turkish Studies-International Periodical for the Languages, Literature and History of Turkish or Turkic, 10(2), 101-122.


Teaching the Alternative Ceramic Firing Techniques to Preservice Visual Arts Teachers: A Case Study*

Berna Coskun Onan
Bursa Uludag University

Tulun Ozturk
Bursa Uludag University

Abstract

The aim of this study is to explain the case that preservice teachers will enable alternative experiences to today's visual arts education by using alternative ceramic firing techniques. In this study, qualitative research was carried out using a single-case study during the 2018-2019 academic year. Six preservice teachers were chosen using the criteria of having the necessary knowledge and skills for ceramic training and teaching, and for being educated in the Fine Arts Education Department. In the collecting data part of the research, the techniques of alternative firing such as; fumed firing, raku firing, saggar firing, and obvara firing techniques were practised in the context of this study. The main research data were based on the observation data collected through the process of the practices which were conducted by the artist-researcher. In addition to observations, a data set was gathered to understand and describe the case such as; lesson instruction materials, diaries, self-evaluation forms, and product evaluation forms. The data was analysed using a descriptive framework based on art education and teacher training literature. The findings of the study represent seven themes; “Adaptation of learning to school conditions”, “Organising practise steps”, “Motivation for creative experiences”, “Suggestions for professional practices”, “Suggestions for problems”, “Adaptability to teaching” and “interaction during the teaching process”. According to the findings, it can be stated that the alternative firing techniques transformed into alternative ways for teaching processes in visual arts education through this case. Consequently, the discussion topics are as follows: “Alternatives motivate creative experience”; “Adapting the alternatives to school conditions”; “Organising steps for alternative practises”; 'Transferring alternative experiences to professional lives’.

Keywords: Ceramic Education; Fumed Firing; Obvara Firing; Raku Firing; Saggar Firing

DOI: 10.29329/ijpe.2022.426.6

* The present study is summarised form of the Master's Thesis, “Alternative Ceramic Firing Techniques and Teaching Methods in Undergraduate Art Education: A Case Study” which was completed by Tulun Ozturk in 2020, under the supervision of Berna Coskun Onan (PhD) at Bursa Uludag University, Fine Arts Department in Faculty of Education. Some collected data of this study has been presented and published as an abstract in Ejer Congress in 2020.

ii Tulun Ozturk, Expert, Faculty of Education, Fine Arts Education, Bursa Uludag University, ORCID: 0000-0003-1693-6674
Ceramic Studio Courses in Visual Arts Teacher Training

Visual arts education is a long-term training process that begins as early as preschool. Throughout education, an individual comes across art in every step of learning and in many parts of their own life. As well as being an essential in life, art education should have an unchangeable place in the education process. Ozsöz described education as: "One of the most powerful tools that allows a society to keep up with novelties and contemporary civilization. To unravel a person's creativity and talents, and in developing these assets and expressing himself/herself, education plays an indisputable role" (2015, p. 13). As for the connection of art with education and the value of art education, Ipsiroglu (1998, p. 30) explained that, “Art is one of the building blocks of contemporary education and in education there is nothing that can replace art. Missing this building block in education would dig holes in personality growth”. Studio courses are spaces in which knowledge meets with skills and activity, (Gocer, 2013; Dasdag, 2017; Dasdag & Gokdemir, 2017; Buyurgan, 2007). One of these practical fields, ceramics, in which art education is taught has been extensively covered in higher education institutes offering art education at undergraduate level.

Ekiz argues that in teacher training there are three main bodies which are listed as; “departmental courses at faculties of education, education sciences courses, and special instructing methods courses” (2006, p. 27). These curriculums are offered to preservice teachers in line with the theoretical and practical structures of their fields. It is widely known that studio courses, in which theoretical knowledge is taught during practice, enriching artistic skills and play a vital role in providing the transition steps to actual teaching professions. In fine arts teacher training departments, these acquisitions are offered via studio courses that provide required or elective art course options. In addition to improving the quantity of such studio courses embedded in teacher training programs, it is equally significant to elevate their qualitative features. Today, there are some emerging acquisitions in which prospective teachers unify their learning fields and creating unique practices that were learnt in a variety of courses. According to Dasdag (2017), it is important to satisfy emerging unifying needs with studio courses where such integrated experiences can be lived critically during preparation or practising processes.

It has been highlighted in researches that have been conducted that preservice teachers, having selected ceramic studio courses offered in fine arts education department/arts and craft programs should be, as qualified teachers, trained in line with the evolving and advancing conditions of the contemporary age and that ceramic education should be offered through all steps of learning starting with the preschool period. With respect to that suggestion, and by taking into account the contributions that arts and craft preservice teachers would offer to social growth, they need to be raised as creative, realistic and intellectual individuals with a developed taste for aesthetics (Duh & Zupančič, 2011) and in full coordination with art history, art criticism, humanistic, and cultural enlightenment. There are other researches that specifically focus on training preservice teachers, who would train future generations, as qualified individuals with technical competency (Aslan & Gokdemir, 2017; Buyurgan, 2007; Bulut, 2001; Li, 2019; Mui, 2010; Sessions, 1997; Yu, 2019). The same studies also suggested that starting with the preschool period, ceramic education should be reformulated in the curriculums at all grades of education, studio settings should be provided, and problems that relate to insufficient tools and equipment etc. must be corrected. A number of studies concluded that ceramic education rendered positive changes in students and could develop their handcrafting as well as visual-spatial intelligences (V. Kacar, 2018; Özşelik, 2015; Çevik, 2014; B. Kacar, 2010; Erman & Ozdag, 2019; Terwiel, 2010; Hansen, 2012; Brewer, 1991; Xiangcui, 2018; Dasdag & Gokdemir, 2017). Three-dimensional artworks include the courses starting as early as preschool grade till the end of basic education and enabling learners to design three-dimensional objects at undergraduate level. Preservice teachers who can touch, feel, and talk to mud and witness the evolution of mud into a concrete object through fantastic images in their hands would ultimately instil confidence in their students while also providing physical, cognitive and affective acquisitions via developing their thinking, drawing, touching and sensing capacity. Furthermore, required perceptions skills relating to form, depth, height, and width could also be created (Ozer & Kalkan, 2016; Capar, 2012; Kahraman, 2018).
Problem statement and significance

There is a lot of research that recommend training individuals that are capable of evaluating art education with a holistic perspective by adopting a holistic perspective. Industrial innovations offer alternative approaches to traditional ceramic art such as limitlessness in using materials in art, contemporary opportunities for presenting, theorizing a-typical ideas and practicing cultural education in art. These changes have also been strongly accentuated in the researches. Managing such changes in ceramic education within the scope of curriculums by the intuition’s authorities is also vital (Sagılyan, 2019; Cetin, 2009; Sung-Min, 2014; Agatekin, 2017).

There are fundamental studies that can reasonably be recognized as guidelines in teaching alternative firing techniques (Acarturk & Timurkaan, 2016; Bozkurt, 2012; Baskırkan, 2010; Dasdag, 2009; Ozcan, 1997). According to these studies, teaching alternative firing techniques to preservice teachers that have gained some experience in ceramic studios is crucial to boosting their self-development and acquiring adaptation experience in their activity settings. These firing techniques can enable advantages by the reason of using different organic materials, and adding accessible materials to the artworks etc. By teaching these alternative skills, preservice teachers would be particularly interested in critical thinking, and problem-solving talents as well as enriching their imagination and esthetical perspective. These interventions would also help them embrace, learn and practice art and raise them as competent teachers. The main gap and necessity in the literature is to be able to explain the case about how the alternative firing techniques can be practised in instructing environments, which acquisitions or changes can be observed, and what the preservice teachers experiences have.

Purpose of the study

At the end of national and international literature reviews it has been detected that in order to keep pace with the contemporary age, art education curriculums must be revised accordingly and that proper settings as well as better suited means may be provided to achieve such transformations. Analysed researches have emphasized the need to spread art education in to all layers of society and the means of this change will be starting with children and the right type of education system that would offer them this opportunity. At this point, it is worth adding an interpretation of the education system. Within the context of this research, what makes this particular study more important is its suggestion that as a result of teaching and performing alternative firing techniques, teachers would gain adaptation experience and be provided solutions to problems if needed. The importance of this study is that in this research, teaching “alternative ceramic firing techniques” that would be presented as a case to preservice teachers in a ceramic studio course would primarily contribute to offer them an experience which they could implement in their own cases by creating essential conditions in their artistic and professional lives. The aim of this study is to explain the case that will enable alternative experiences to today’s visual arts education by using alternative ceramic firing techniques.

(1) What are the acquisitions of alternative ceramic firing techniques to be implemented within ceramic studio courses in visual arts teacher training?

METHOD

Research design

Qualitative research is an analysis method in which the aim is to acquire detailed information on a subject, case or approach by making sense of experiences (Creswell, 2018). In this research one of the qualitative research designs, the single case study, was utilised. Yin argues that case studies are an empirical research method; (1) Analysing a current event with respect to its actual life framework (context), (2) In which the borders between case and experienced context are blurred, (3) Used in cases in which there are multiple evidences or data resources (Yin, 1984, p. 23). In this case study, it was aimed to explain the case that emerged with the related techniques in a comprehensive way. Unlike action research, it was not aimed to improve the process by intervention through process or
actions. For this reason, Yin’s (1984) case study approach and description was adopted, and the case was limited with the applicability of alternative firing techniques throughout the ceramic studio course training process. In this research, among a small study group consisting of preservice teachers trained in the field of ceramic education, a single-case that seeks an answer to the research question was conducted.

Study group

The study group consisted of six preservice teachers fitting the criteria of having received a ceramic education and having sufficient preparedness of prior knowledge and basic experiences. With this aim, preservice teachers were determined via student identification form (SIF) on the date 21.02.2019. Additionally, one of the researchers was a participant during the case because they designed the process and taught it (Creswell, 2016, p.190). For Patton (2018) the criteria sampling strategy, one of the intentional sampling strategies, refers to examining related cases that can meet a list of predetermined criteria. Here, “the criteria can also be formed by the researcher (Yıldırım & Simsek, 2018, p. 122)”. In accordance with ethical considerations, the preservice teachers participated in the research on the basis of the voluntariness principle and pseudonyms were used instead of their actual names. The necessary information of the participants in the study such as gender, whether going on main or elective art studio courses, education periods, and technique sufficiency for alternative firing techniques that were determined by researchers, can be found in the Table 1. For this case study, it is sufficient for preservice teachers to have some basic qualifications. The qualifications learned in the first semester for both main and elective art studio courses can be briefly listed as follows: defining, forming, retouching, drying, glazing and firing skills. The qualifications listed in Appendix 1. are sufficient to practice, learn and teach alternative techniques, as these are easier than the traditional firing techniques, materials brought from real life and/or nature. This is because these are primitive techniques that can be practiced with various materials. The preservice teachers who had the skills required were defined after observed by both of the researchers during previous studio experiences in terms of the basic skills shown in Appendix 1. Before conducting the case study, the results as to whether they had the basic qualifications of ceramic education or not were checked separately by the researchers.

<table>
<thead>
<tr>
<th>Participants’ pseudonym/ Age range</th>
<th>Gender</th>
<th>Semester</th>
<th>Main/Elective art studio</th>
<th>Technique sufficiency for alternative firing techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pırıl 18-25 F</td>
<td>2nd</td>
<td>Elective</td>
<td>Sufficient</td>
<td></td>
</tr>
<tr>
<td>Canan 18-25 F</td>
<td>4th</td>
<td>Main</td>
<td>Sufficient</td>
<td></td>
</tr>
<tr>
<td>Buse 18-25 F</td>
<td>4th</td>
<td>Main</td>
<td>Sufficient</td>
<td></td>
</tr>
<tr>
<td>Nevin 18-25 F</td>
<td>2nd</td>
<td>Elective</td>
<td>Sufficient</td>
<td></td>
</tr>
<tr>
<td>Beren 18-25 F</td>
<td>4th</td>
<td>Main</td>
<td>Sufficient</td>
<td></td>
</tr>
<tr>
<td>Berrin 18-25 F</td>
<td>4th</td>
<td>Main</td>
<td>Sufficient</td>
<td></td>
</tr>
</tbody>
</table>

Researchers’ roles

Creswell claims that, “A researcher's role is taking notes in the research site on the activities and actions of individuals. Via these notes, researchers take notes on activities in an unstructured or structured mode at the research site. Qualitative observers can take part in the task by fulfilling a range of missions from nonparticipant observation to full participant observation (2016, p. 190)”. In this research, one of the researchers reflected her knowledge and artistic experiences regarding the ceramic art and teaching process and conducted the data collection process that happened concurrently. The other researcher is her superior and an expert on visual arts teaching methods. She contributed to the study in the processes of defining participants, preparing tools, data collection, data analysis, reporting and providing coherence of inquiry.
Data collection process and practices during the case

This research was conducted during 2018-2019 spring term in ceramic studio courses within the Arts and Crafts Teaching Program of the Fine Arts Education Department in the Faculty of Education. The data collection process was conducted concurrently with the practices which involved Fumed firing, Raku firing, Saggar firing and Obvara firing that would be performed with the participant preservice teachers and artist-researcher. The alternative techniques are cheaper than traditional firing techniques because materials used are those from real life or nature and are available for all school environments and even those studios that lack a kiln. The reason for this is that they are primitive practices that can be practised with any materials. The data collection process which was conducted concurrently with the alternative firing practices can be inspected in Table 2. The data collection process started at 28.02.2019 and finished at 29.04.2019. Within two months, the artist-researcher planned the cases according to alternative firing practices and conducted them during the five subsequent steps. Each step consisted of four hours of studio courses that were integrated with approximately two hours theory and two hours practice. Additionally, in the research an authentic evaluation process has been designed instead of a numerical measurement approach specifically for this case study. According to Dube (2009), the authentic assessment approach is suitable for lessons or situations where usual approaches are not conducted. The authentic evaluation approach is a type of assessment that allows students' diversity, originality, and individuality, and allows multiple answers to questions. It also includes cognitive, affective and psychomotor learning components. For the reason that this case study consists of various forms such as PEFs, SEFs, LOFs, PTDs, and SIFs, it can be stated that an authentic approach is used in this study.

Table 2. Data collection process and practices during the case

<table>
<thead>
<tr>
<th>Step</th>
<th>Practice</th>
<th>Course credits</th>
<th>Data Collection Techniques</th>
<th>Tools</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparing</td>
<td>1 T+3 P</td>
<td>1. Observation</td>
<td>LOF-I, PTD</td>
<td>28.02.2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Document analysis</td>
<td>LIM</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Fumed firing</td>
<td>2 T+2 P</td>
<td>2. Observation</td>
<td>LOF-II, PTD</td>
<td>14.03.2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Document analysis</td>
<td>LIM, SIF-I, PEF I</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Raku firing</td>
<td>2 T+2 P</td>
<td>3. Observation</td>
<td>LOF-III, PTD, LIM, SIF-I</td>
<td>21.03.2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Document analysis</td>
<td>PEF II</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Saggar firing</td>
<td>2 T+2 P</td>
<td>4. Observation</td>
<td>LOF-IV, PTD, LIM, SIF-III, PEF III</td>
<td>04.04.2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Document analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Obvara firing</td>
<td>2 T+2 P</td>
<td>5. Observation</td>
<td>LOF-V, PTD, LIM, SIF-IV, SEF, PEF IV</td>
<td>25.04.2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Document analysis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Preparing and forming the objects and Saggar box step. For each ceramic products that alternative firing would produce, the formation procedure was started after choosing the appropriate clay and form for the firing procedure. Preservice teachers with limited to producing four basic shapes; cylinder, triangle, rectangle, and circle. They used different types of clays to see the different surface effects after biscuit firing. Biscuit firing is a basic or pre-firing step for every type of ceramic firing method. One of the objects which formed using four different clays after biscuit firing is exhibited in Photo 1 below. This is the first practice step and basic for four alternative firing techniques. The other beginning step is to prepare a firing box which is called Saggar Box and used for preventing objects while they are firing. The preparation step in the data collection process and concurrently used data collection tools can be seen as step 2 in the practice column in Table 2.
Just like the other alternative firing techniques, the fumed firing technique is a also primitive-based firing type. In the past fume traces formed on surfaces after a firing used to be an unwanted effect. However this effect is eagerly sought-after and intentionally created by some contemporary ceramic artists (Bozkurt, 2012, p. 22). Outdoor firing is based on the principle of firing imbricated raw ceramic products that are covered with organic flammable materials like wood, leaves or tree branches. The fumed firing technique can be performed by digging holes outside or using metal containers like barrels and cans. During the practice process, a metal barrel was drilled from the bottom before the procedure so that air channels allowed good cautery and air circulation could be created inside the barrel. For the cautery procedure, tree branches, leaves, cones, sawdust, newspaper pieces, kindle and green-leaf pine branches were procured and prepared.

The order of this step in the data collection process and concurrently-used data collection tools are shown as step 2 and practice column in Table 2. In Photo 2, the images of the fumed firing step are displayed from left to right. To initiate the cautery practice, first the bottom of the barrel was covered with sawdust and tree branches. Then ceramic products were placed on the top of the barrel after mixing salt, colouring oxides, copper and aluminium strings. Materials were attentively placed to avoid damaging each one and they were covered with sawdust, branches and other materials to build up a pile. In Photo 3, preservice teachers’ fumed firing works can be seen.
Photo 3. Preservice teachers’ fumed firing artworks. (PEF-I)

Raku firing practice step. This is a firing technique in which observable effects are created on the surface of glazed and non-glazed parts of ceramics, where they meet with fire and fumes. Before the practice process each preservice teacher was asked to choose from different-clay objects that were created during the biscuit firing (in the first step). A capped metal box and water-filled container were procured for the reduction. To start the cautery procedure, materials such as sawdust, newspaper pieces, cones, and pine leaf, were prepared and carried near to the kiln. Metal containers were filled with varied amounts of saw-dusts, newspaper pieces, and other materials. Glowing ceramic products were removed from the kiln via tongs and placed inside the prepared metal. While burning, saw-dust was used to cover the surface of the products so that objects were exposed to greater amounts of fume in order to create effects on surfaces, to support the burning process. In the blazing fire, they waited a little while so that the materials would burn, and the metal containers were tightly closed to allow reduction and prevent air penetration. All steps of Raku firing are shown in Photo 4.

Photo 4. Raku firing practice steps (3rd observation, LOF-III)

At this step, by creating an oxygen-free environment, the ceramic products were exposed to fumes. The carbon-gas that emerged from inside the metal containers affected the structure of the body and glazed surfaces, hence effects could be created. At the end of this practice, ceramic products were removed from the metal containers using tongs. Next they were left inside the water-filled container to cool. The order of this step in the data collection process and concurrently-used data collection tools can be seen as step 3 and practice column in Table 2. In Photo 5, preservice teachers’ raku firing works can be seen.
Saggar firing practice step. Saggar firing is one of the alternative firing techniques that involves putting a product inside a capped container during firing to preserve glazed and unglazed ceramic products. In practice process at the end of lining procedure the objects were, covered by copper wire, put inside a saline solution and then wrapped with squeezed cotton cloth pieces so that products could be prepared. Prior to the preparation step of saggar boxes, of which the biscuit firing had been completed, they were put inside the box which was then covered by salt, oxide and sawdust at the bottom. Additionally, in Photo 6 the saggar firing steps are exhibited.

Prepared objects were put inside the box one by one and placed in piles. Later, fruit skins, pine branches, cones, walnuts, almonds and organic materials were orderly placed to separate the objects. By adding salt, oxide, metal salts and similar materials, the piling procedure could be finished. When the packaging procedure ended, the cap of the box was tightly closed. It was lined by soft clay to prevent oxygen penetration. Saggar firing boxes were placed into the kiln to burn at around 950°C-1050°C. While burning, easily-inflammable organic materials inside saggar boxes caught fire and as a result of the fumes, unique lines and effects that change from light to dark tones are formed on the surface of objects. Once the kiln was completely cooled, the saggar boxes were removed from the kiln. The thoroughly-cooled boxes were opened, and the removed objects were cleaned to remove ashes and washed. The order of this step in the data collection process and the concurrently-used data collection
tools are presented as step 4 and practice column in Table 2. In Photo 7, preservice teachers’ saggar firing works can be seen.

Photo 7. Preservice teachers’ saggar firing artworks. (PEF-III)

Obvara firing practice step. Obvara ceramic firing is a firing technique in which, biscuit-fired ceramic products are preheated and soaked inside a yeast solution composed of organic materials. “Obvara ceramic firing/decor technique can be explained as a technique that is generally formed by burning traces left on the ceramic biscuit product as a result of heat by organic products” (Irdelp, 2016, p. 84). In Photo 8, the steps of obvara firing techniques can be seen.

Photo 8. Obvara firing practice steps. (5th observation, LOF-V)

In the practice process, ceramic objects were put inside a kiln for heating at around 850°C-900°C. The Kiln's cap was opened and the glowing objects were removed using tongs and swiftly soaked into an organic yeast solution. Once again, they were quickly removed from the yeast container and soaked in a water-filled container; thus ceramic objects could be cooled and the effects created on the surface can be fixed. During Obvara firing, yellow and light-dark brown effects are created by the organic materials stuck on the surface of objects being burned. The order of this step in the data collection process and concurrently-used data collection tools are displayed as step 5 and practice column in Table 2. In Photo 9, preservice teachers’ obvara firing works can be seen.
Data collection techniques and tools

Observation. To describe the case within defined limits, observation was the main data collection tool of the case study and the activities were video recorded in ceramic studio. For each separate activity, video and sound records that covered instructing, practice, firing and post-practice steps were created and also by using lesson observation forms (LOF), observation data could be transferred to text. In order to fully reflect the complexity of the case, observation of a case after direct participation is the best research method (Patton, 2018, p. 21).

Interview. Interviews are a qualitative data collection technique that allows interaction between the researcher and participant (Glesne, 2012, p. 140). Interviews were conducted at end of the activities by using semi-structured interview forms (SIF) that included open-ended questions that addressed research problems and questions. The prepared interview questions were based on the content of the lesson instruction materials, the aim of the research, and the research questions by artist-researcher, and then checked for validity by the other researcher who is an expert in visual arts education field in terms of compatible with the aim. A detailed example of an interview form (SIF-II) with questions for the Raku firing technique can be seen in Appendix 2.

Document Analysis. In case studies, it is very important to be able to describe the case in the most comprehensive way. For increasing research validity, in addition to interview and observation methods, documents such as printed and visual materials can be gathered and added to the analysis process; hence databases can be enriched (Yıldırım & Şimşek, 2018, p. 296). In the research, document analysis which is a data collection technique was conducted through various forms seen in Table 2 designed by the artist-researcher and the expert-researcher. Firstly, the product evaluation forms (PEF) include fundamental criteria relating to the four alternative firing techniques and based on products’ practical and artistic elements such as (a) formal qualities, (b) firing effects on surfaces, colours and (c) reflections of technique comprehension. An example of the PEF form which was formed by both of the researchers can be seen in Appendix 3. An example PEF-II filled for a preservice teacher’s Raku product in Appendix 7.

Additionally, to ensure all details relating to the case were described, variety in the research data was enabled through data collection tools such as lesson observation forms (LOF), lesson instruction materials (LIM), self-evaluation forms (SEF) which consist of 17 evaluation items about techniques (Appendix 6), and preservice teacher diaries (PTD) for each techniques (Appendix 5). Additionally, example of structured items requiring filling in the blanks in the diaries can be seen in Appendix 4.

Data analysis process

The data collected via observations, interviews and documents were analysed using the descriptive analysis approach. “In this approach obtained data are summarized and interpreted
according to pre-designated themes. Data can be regulated with respect to the themes put forth by research questions or by considering questions and dimensions employed in the interview and observation procedures” (Yıldırım & Şimşek, 2018, p. 239-240). Cause-effect relations were investigated, results were attained and correlated with emergent themes and explained, predictions were made and interpreted in a described data set in this analysing process. Throughout the analysing process, the researchers took lots of preventions. They separately coded the data and then, they checked each other’s interpretations on relations for ensuring consistency. At the end of the process, emergent themes were checked again for reliability by the expert-researcher in terms of coherence with visual arts education field.

**Validity and reliability**

Different strategies such as plausibility and consistency are adopted to provide a standard in qualitative studies and to support validity and reliability. (Merriam, 2013, p. 210). The first of these strategies are long-term and require intense participation (Creswell, 2013, p. 250). To increase validity and reliability in this study, context and descriptions were provided in an open and clear format so that it would be possible to ensure variety in data resource and data collection tools. Furthermore, findings were described in a comprehensible style via direct quotations and student products for ensuring plausibility. In addition, reporting was completed in an objective manner through images of process and products. In this research, the problem statement is based on the related to the literature, objectives were identified in a compatible manner and designs were utilised in the proper way to meet designated objectives so that it would be possible to ensure consistency of study. In qualitative researches, defining the study group is extremely important. For this reason, all of the data collection forms prepared by artist-researcher were also checked by the expert-researcher art education in terms of visual art contents for ensuring validity. With respect to plausibility, the role of researchers in the case study was openly displayed related sections (Akar, 2016, p. 135).

**Ethical considerations**

The ethical considerations for the research were administered in line with basic principles suggested for qualitative researches by Miles and Huberman (2019). The research objective, topic, context, planning of practice steps and process implementation were extensively explained to participant preservice teachers with an aim to raise awareness and were asked to participate voluntarily. To conduct the research, required permissions were received from the institution and participants. To ensure that the research would not be biased but abide by its objectives only, gender of the participants was concealed by using pseudonyms like Pırıl. The consents of the participants for their views were obtained with forms.

**FINDINGS**

This research, began with the question “What are acquisitions of alternative ceramic firing techniques to be implemented within ceramic studio courses in art teacher training?”. The “Professional Acquisitions” category was composed of findings that explain the case in which alternative ceramic firing techniques used. Accordingly, a category formed with themes such as “Organisation practise steps”, “Suggestions for professional practices”, “Motivation to creative experience”, “Suggestions for problems”, “Adaptability to teaching”, “Interaction during the teaching process” and “Adaptation of learning to school conditions”.

*Organisation practise steps*. This finding relates to the explanation of procedural steps prior to performing the obvara firing technique. Within that context it can be defined as the operation process that explains all practices in their respective order starting with the first step of activity implementation. The researcher explained the obvara activity like this; “…first of all we will line the kiln … in the first step this will be completed. Next we will put it inside the kiln and then fire the product. In the next step, as we did in raku, we will remove the object from kiln and soak it into the solution …” (Researcher, LOF-V) the explained activity. Additionally, in the organising practise steps
Pîrl’s sample explanation, that was noted in her diary, can also be referred to as cropped image in Photo 11. In addition to this is shown in Appendix 5. In this explanation Pîrl wrote that; “We applied the line onto our form that had biscuit firing and while we left certain parts in the open we covered some others with blue lining to observe the effective ones. We put our works inside the kiln and when the heat reached around 900°C we opened the kiln and took our works with tongs.” This statement is a clear illustration of the way each activity was started and followed steps. Later the same preservice teacher remarked that “After we took out our works, we soaked them into the prepared yeast, milky solution to wait for 2-3 seconds. After removing them from the solution we soaked them into water and fixed the effects in that way.” this statement highlights further steps of the practice (Pîrl, PTD-V). The other example of comprehension of technique is below in Photo 10. Pîrl had been doing Obvara practise at that moment.


Photo 11. Pîrl’s thoughts about stepping of Obvara technique (PTD-IV)

Suggestions for professional practices. This heading includes the process in which the adaptation of alternative firings performed in the research was suggested for school settings and preparing basic conditions was highlighted. The researcher’s statement explains this: “You see we
perform them in such different conditions. To make obvara firing … Firstly the firing of the works should be performed inside a barrel or a suitable setting like a hole. Later, after heating inside the barrel or can, you can soak the prepared solution. In school conditions you should always have an opportunity for actual practice” (Researcher, LOF-V). Ceren made informative insights about how relevant works performed: “I absolutely believe that this is one technique that I can practice at a school but of course it must be conducted under my supervision because all the materials are natural. After a test pre-firing, I could implement this technique with my students. There are so many materials that they could bring from their home and I hope that would be an extraordinary experience for them as well” (Ceren, SIF-IV).

Motivation to creative experience. Nevin, while questioning the content of yeast solution prepared in obvara firing, stated her curiosity; “So while preparing these solutions we mix so many ingredients but is there anything that should never ever be mixed?” (Nevin, LOF-V). she continued by adding; “If lemon peel has no effect at all then it looks like there is no use in adding is” this statement is an explanation of her questioning mind. This participant responded as such; “It could be added… we just do not know why it shouldn’t… or what effect it would create, hence it must be tested” as an explanation. Another relevant example is Pırıl’s statement: “We could use so many materials. After we took the prepared solution out of the kiln, we added the solution to test, we could use many different materials and observe varied effects caused” (Pırıl, SIF-IV). In this step it was explained to the participants that all of the planned authentic material choices had to be first tried and tested. Additionally, artist researcher’s views can be seen in Photo 12. that shows a cropped image of Buse’s Obvara (PEF-II) product that are positive. Her views point out that technical maturity can be mentioned in terms of high-level skills and creativity due to the various influences on the product.

Photo 12. Artist-researcher evaluation views on Buse’s Obvara Product (a cropped image of PEF-II)

Suggestions for problems. In this step the objects that received saggar firing and removed from the box are examined together with preservice teachers. Within that context, a researcher suggested that; “If we re-fire the lighter ones we could darken their colour tone” (Researcher, LOF-IV). In addition, by recalling earlier course narratives the researcher stated that preservice teachers could, at all times, come up with solution-driven ideas. Additionally, the other finding can be stated about this manner through a cropped image of Buse’s diary in Photo 13. Buse had written on her Raku practise by using various clays as follows: “I tried to do big blanks for the second-coloring step, so I made it more colorfull according to Raku firing technique”. In Photo 5 there are preservice teachers’ works in which the Raku firing technique was performed.
Adapting discoveries to school conditions. In the course context where alternative firing techniques are explained and required forms for practices are also produced, the process in which adaptability of scheduled alternative firings into the teaching profession is integrated. Researcher's statements for this step are as follows: “When you become a teacher you should perform these practices in a simple setting by adapting them to the school’s conditions” (Researcher, LOF-I). There are a lot of thoughts in diaries of Pırıl, Ceren, Nevin, Buse, Beren and Berrin about the theme of adapting in the data and one example of them is shown as a cropped image in Photos 13.

Adaptability to teaching. This heading when placed within the professional acquisitions theme of the fumed firing technique refers to the process in schools. It may be explained in terms of the notion to encourage preservice teachers to attempt activities that are suitable for schools with outdoor facilities. The same argument is clearly worded in researcher observations: “This firing method is a practice that can be performed outside in many different schools” (LOF-II). In that sense, some of the statements of preservice teachers can be given as examples: Beren, “I think that if necessary conditions are provided by observing work safety, then this is a technique that I can comfortably teach to my students” (Beren, PTD-II) and Beren's statement as; “I consider that if the required conditions are provided, I can apply this technique in any high school. Particularly for students in fine arts high schools, I hold the belief that this technique is useful to help them gain different perspectives and develop their knowledge about ceramics” (Nevin, PTD-II). Similarly, Buse said that; “When I become a teacher, being able to display to my students primitive methods is one technique that could be used if needed, if there are favourable conditions provided in my assigned school. This could furnish students with a different perspective. It could contribute to their learning by experiencing it and it could help to make learning permanent” (Buse, PTD-II). At the same time, for the question of “learning about primitive firing techniques” Pırıl, Ceren, Nevin, Buse, Beren and Berrin answered “Yes” (SEF, 6th item). The answer can be seen via the cropped image in Photo 14.
Since fumed firing is a low-cost and low-grade firing method that offers quick results, it is not hard to adapt this firing for a school setting. It has another advantage since this firing does not require a kiln to setup. A similar notion was shared by Buse, “I have learnt a different technique. It is a simple and a rather primitive technique and I do believe that I could perform this technique in the settings of my own design. This is exactly what I have learnt. It is also reasonable in terms of finance” (Buse, SIF-I).

Interaction during the teaching process. Whilst -the lining and glazing step of raku firing procedure was explained, and in response to preserviced teachers' feedback, the researcher, who also acted as the implementer in the entire procedure, formed empathy and asked “Did I explain it in a confusing way?” (Researcher, LOF-III) and criticized herself. Berrin, in response, stated that “Transparent lining, glaze... all that has been confused in my mind”. In that sense, and with an aim to prevent any potential confusion for preservice teachers, the researcher used simpler and less complex statements till the end of the process. Regarding the LOFs, it can be indicated that interaction in the studio was not only between artist researcher and preservice teachers but also among preservice teachers during the case. Interaction about the teaching process which occurs among the preservice teachers during the teaching process can be seen below in Photo 15.

The study group were informed that the narrative style had a critical role and it was necessary to explain the lesson in a way to match preservice teachers' comprehension level.

DISCUSSION AND SUGGESTIONS

This research, began with the question “What are acquisitions of alternative ceramic firing techniques to be implemented within ceramic studio courses in art teacher training?”. In this section,
the findings listed previous are discussed by making connections to the literature through comprehensive titles, and various suggestions are made. The results in qualitative studies are unique, case-specific and cannot be generalized. For this reason, the discussion titles which emerge after the research process can be generalized only within readers’ comprehensive and comparative views or approaches.

Alternatives motivate creative experience

Motivation to creative experience shows that preservice teachers had a tendency to adopt different practice approaches, creative thoughts, materials or surface effects seen through LOFs, PEFs, PTDs and SIFs. Looking at their thoughts and views during interviews about techniques, process etc., behaviours observed during practises, and the products created after their practises, they clearly felt motivated and creative. Creativity and motivation through alternative techniques can be comprehended in three dimensions within this research. The first dimension is for individual artistic changes, the second is interaction during production, and the last is their readiness or eagerness for being a visual arts teacher and reflecting their experiences to teaching processes.

Firstly preservice teachers agreed that experiencing alternative firing techniques enhanced their creativity, assisted in creating different insights and consequently encouraged them to explore alternative thoughts, alternative practices with various materials from daily life or nature, and to be open to various thoughts through interactions in the studio as seen in LOFs, PTDs and SIFs. Alternative firing techniques practiced can be understood in terms of completing products successfully, as seen in product evaluation forms and also for the “suggestions for problems” theme. The findings align with the objectives issued by YOK in 2019 under the title of regulations for Arts and Craft Teaching Undergraduate Program. The regulation obligates that students must have taken required and elective art studio courses “and must have learnt to create works via different techniques and materials should experiment varied techniques and practices must be able to teach them through creative-boosting activities in their own profession” (YOK, 2019, p. 25). Aslan and Gokdemir (2017) stated in the conclusion of their study that preservice teachers perceive ceramic education as an art discipline that increases their imagination. Ozdag (2019) and B. Kacar (2010) stated that children who receive ceramics education at an early age are especially compatible with their environment and that revealing their contributions in terms of their social and psychological development at an early age contributes to creativity. When comprehensively analysing many other studies conducted at primary and secondary education level that support these views (Ozer & Kalkan, 2016; Capar, 2012; Kahraman, 2018), analysis of ceramic teaching and three-dimensional artworks with respect to learning processes and creativity can be seen. By endowing visual arts course teachers with ceramic education it is viable to train teachers who can instil love of ceramic among future generations and also to let them invest in enhancing of ceramic art.

The second dimension of the motivation is about interaction in the studio. Interaction can be understood not only in terms of the acquiring “seeing different perspectives” explanation, but also in terms of the “interaction during the teaching process” result that revealed that before, during, and after the practice such activities helped to increase interactions seen in the LOFs and PTDs. It can be stated that interaction about teaching process occurred not only between artist researcher and preservice teachers but also among preservice teachers during the case. Cevik’s (2014) study deserves attention in that examining communication skills targeted in ceramic education: “Through the ceramic design and technology program it is primarily aimed to give to people the knowledge and skills of basic sciences as well as instilling the ability to form effective human relations as a requirement of our age, to engage in communication, to adapt to changes and current technologies, to construe and use systems and materials” (p. 161).

When it comes to the last important dimension in providing motivation and creativity through alternative techniques, it can be said that preservice teachers are extremely willing to learn and teach alternatives based on PTDs, SIFs and LOFs. According to the authentic evaluation (Dube, 2009) in this case, all participants expressed their satisfaction with learning alternative methods and techniques,
and producing works using different materials in the interviews in SIFs, reflections in PTDs, and the artworks evaluated with PEFs, and especially in actions seen with LOFs. Briefly, they actually also felt motivated to reflect such approaches onto their teaching experience as seen in the PTDs and SIFs. The findings in the LOFs, SIFs and PTDs indicate that most of the acquisitions which are aimed to be instilled in preservice teachers like thinking, designing, observing and questioning in today’s art education. This would assist them in guiding future generations to keep up with today, and adapting alternative techniques to the schools through alternative firing techniques. This manner is also in parallel with the results of many other studies. This result about visual art teachers’ guiding future generations corresponds to the Council of Higher Education’s suggestions, as follows: “...by taking into account artistic development features of primary and secondary education students, making a connection with today’s art approach as well as interdisciplinary and intercultural works related to artistic practices” (YOK, 2019, p. 25). This objective stated within the visual arts teacher training context of the common curriculum is abided by all Higher Education Institutes in Turkey and offers similar findings to many other researches in the art education field (Li, 2019; Mui, 2010; Sessions, 1997; Yu, 2019). In relation to the same issue, Bulut (2001, p. 84) argued that, “ Studios could be treated as an education system where theory and experiment can concurrently be executed”. Similarly, the statement by Ozsoy and Sahan (2009, p. 211) “It presents a list of humanistic methods that call for practice, thinking, perception, sensing, imagination and most importantly the activity” deserves attention by the reason of emphasizing the need to practice. Based on that viewpoint, that when studies focusing on child development in contemporary art education are examined, V. Kacar’s work (2018) is also remarkable. He emphasized that by popularizing art lessons, in which theoretical knowledge is supported with practice, at all levels of education, will improve creative behaviours and strengthen hand-motor muscles. Bolukoglu’s (2002, p. 255) remarks on the same issue draws a close parallel with the results of this study. According to her, it is essential that teachers of the future should immediately adopt a contemporary approach in practice and correct their deficiencies with no need for extra time to keep up with developments of the age.

**Adapting the alternatives to school conditions**

The research findings which were obtained from preservice teachers’ views seen in the SIFs are mostly about the “adaptation of learning to school conditions”. In this study, preservice teachers who experienced alternative firing techniques stated that the techniques are low-cost, and that low-grade firing methods offer quick results, in addition to this, they are not hard to adapt into school settings or conditions. Alternative techniques have another advantage since this method of firing offers the means to form its own setup if there is a lack of kiln or studio. Diaries, observation data and artworks fired alternative techniques show the possibilities for adaptation to various school conditions. “Adaptation of learning to school conditions”, “suggestions for professional practices”, “suggestions for problems” and “adaptability to teaching” themes obtained in the research refer to the adaptability of alternative activities that can be implemented in institutions having no kiln. These findings are in parallel with the recommendations referred to in many of the studies in literature in terms of adaptation to various practises (Saghyan, 2019; Cetin, 2009; Sung-Min, 2014; Agatekin, 2017). The approaches of preservice teachers which were aimed to be acquired through alternative activities in the study indicate the attainability of the objectives. Prior to organizing similar activities, it is recommended to examine similar researches in relevant literature (Acarturk & Timurkaan, 2016; Bozkurt, 2012; Baskirkran, 2010; Dasdag, 2009; Gocer, 2013; Ozcan, 1997). Based on this context, it was determined that the most important thing about the importance of ceramics education for the training of individuals is to train teachers who can present the alternative teaching methods, and who are experienced.

**Organising steps for alternative practises**

In this research, findings that originate from the “organising practise steps” theme found at PTDs, SIFs and LOFs suggests that preservice teachers can properly employ these practices in their professional life. According to the authentic evaluation in this case, all preservice teachers agreed that via these activities they could plan, practise and evaluate their teaching activities, and could even offer
suggestions in their PTDs and LOFs. The data gathered via diaries, interviews, observations with LOFs and products examined with PEFs shows all of the sequential organising steps were comprehended by the preservice teachers. The preservice teachers’ products were evaluated with the following three items in PEFs: (a) formal qualities presenting information, (b) firing technique qualities, effects on surfaces and (c) reflections of technique comprehension. According to evaluations, the products possess many qualities for each item such as comprehension from an art historical perspective, and formative and technical sufficiency. Preservice teachers’ self-evaluations and diaries about process seen in the PTDs, techniques and products have many qualifications aimed through these techniques. These findings including also authentic evaluation are compatible with the content on ceramic education in the teacher training regulation of YOK (2019); “It covers historical development of ceramic art and ceramic’s current position in everyday life; miscellaneous techniques in artistic and industrial ceramic dimensions; works that are created by adopting traditional, contemporary and authentic interpretations; besides it enables students to make connection between their works and different disciplines while also making sense of contemporary artistic works”.

Furthermore, in a study conducted by Aslan and Gökdemir (2017) to evaluate students’ viewpoints in the ceramic department of faculties of education many of the findings communicated in the conclusion part can also be associated with the results of this case study. In their study, it is suggested that to conduct practices that integrate applying alternative firing techniques and methods is beneficial and so the participation of preservice teachers giving ceramic studio courses could be formed in different school conditions at the secondary education level and to various age groups. Therefore it is possible to offer contributions to teachers and researchers interested in visual arts teacher training.

*Transferring alternative experiences to professional lives*

In relation to that context, “suggestions for professional practices”, “suggestions for problems” themes occurred with PEFs, LOFs and SIFs besides organising steps for alternative practises are related to Ekiz’s (2009) suggestion in theorizing teacher training. Because this suggestion presents views on professional-life transition of the preservice teachers constructed with the three types of knowledge as follows: field knowledge, knowledge of field education, and professional knowledge. According to the programmes of Arts and Craft Education "In studio courses it is suggested not to focus on practice alone but also to provide the right kind of activities addressing students' written narratives on a relevant field, and active participation through reading, research, and discussions” (YOK, 2019, p. 7). Major findings of the research within the context of professional acquisitions are related to the conclusion and suggestions in many literature studies too (Aslan & Gökdemir, 2017; Buyurgan, 2007; Bulut, 2001; Li, 2019; Mui, 2010; Sessions, 1997; Yu, 2019). According to Dube’s (2009) the authentic evaluation in this case, in their professional lives, preservice teachers will be able to perform these activities without being restricted by physical conditions in visual arts courses at secondary education level and compared to other techniques they can more comfortably perform the fumed firing technique under school conditions which is convenient. By blending alternative firing techniques with one another and by using their own firing materials too, teachers and students can easily apply these techniques. Cevik (2014) has an opinion on this issue as follows: “In relation to usage frequency of teaching method and techniques employed in ceramic course by teachers, it is known that the most widely employed method or technique is hands-on training” (p. 166). It may be therefore suggested that current curriculum contents of main or elective art courses in ceramics be also updated in line with various materials or firing techniques for training preservice teachers within this research. Within that context, after a reanalysis, restructuring of main art studio courses’ and elective art studio courses’ curriculums and studio durations has become even more vital. To help train creative and skilful teachers, with various study groups should be defined and researches in which qualitative, quantitative and mixed approaches are employed should be conducted and findings of these researches should then be compared with each other and correlated.

**Acknowledgements:** We would like to thank Mr. Peter Connington as a native lecturer who graduated from Leeds Metropolitan University with a BA (Hons) in English Literature. He agreed to proofread the full text and the appendixes despite his busy schedule in Bursa Uludag University.
REFERENCES


Yu, F. (2019). Elaboration of the importance and necessity of extracurricular learning for students who major in ceramic art design in Universities. *This is an open access article distributed under the terms of the Creative Commons Attribution License.* https://doi.org/10.1051/itmconf/20192601009

### Appendix 1.

**Defining preservice teacher form**

<table>
<thead>
<tr>
<th>Preservice teacher’s name: ………………………</th>
<th>Artist-researcher decision</th>
<th>Visual arts education expert decision</th>
<th>Preservice teacher’s decision on own sufficiency</th>
<th>Decision about sufficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic qualifications in ceramic education for Alternative firing techniques</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defining knowledge and skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defining three-dimensional artworks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distinguishing artworks such as sculpture, relief and ceramic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowing ceramic clay and its types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing knowledge and skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kneading ceramic clay</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation ceramic clay</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deaeration of ceramic clay</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forming skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free technique</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plate technique</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sausage technique</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drying skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In studio environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without direct sunlight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retouching skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning with a sponge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning with a light sander</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glazing-firing knowledge and skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowing glaze types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practising glaze types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First (biscuits) firing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firing with glaze</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Appendix 2.**

*Semi-structured Interview Form (SIF-II) for Raku firing technique*

<table>
<thead>
<tr>
<th>Preservice teacher name:</th>
<th>Interview subject: (Raku)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher name:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

Which knowledge did you transfer from your early learnings for this practice?

Which alternative materials can you use for this practice?

Which experiences did you have during this practice?

Which acquisitions did you gain through this practice?

What kind of problems did you encounter during this practise and how did you solve them?

How do you use the alternative firing techniques in your professional life?
Appendix 3.

Product evaluation form (PEF-II) for Artwork with firing Raku Technique

<table>
<thead>
<tr>
<th>Preservice teacher name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Reflecting qualifications on to the object within formal qualities.

<table>
<thead>
<tr>
<th>During the process</th>
<th>At the end of the process</th>
<th>During the process</th>
<th>At the end of the process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
</tr>
</tbody>
</table>

Surface effects, color effects and textural effects etc.

<table>
<thead>
<tr>
<th>During the process</th>
<th>At the end of the process</th>
<th>During the process</th>
<th>At the end of the process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
</tr>
</tbody>
</table>

Technique comprehension, higher skills creativity etc.

<table>
<thead>
<tr>
<th>During the process</th>
<th>At the end of the process</th>
<th>During the process</th>
<th>At the end of the process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
<td>Researcher’s explanations</td>
</tr>
</tbody>
</table>
Appendix 4.

Preservice Teacher Diary (PTD-II)

<table>
<thead>
<tr>
<th>My Raku Diary</th>
</tr>
</thead>
<tbody>
<tr>
<td>While preparing for this alternative technique process, I had some new experiences …</td>
</tr>
<tr>
<td>While practicing this alternative technique, I had some new experiences …</td>
</tr>
<tr>
<td>During the ending process of this alternative technique, I had some new experiences …</td>
</tr>
<tr>
<td>I can feel that this alternative technique in my artistic life is …</td>
</tr>
<tr>
<td>I can feel that this alternative technique in my professional life is …</td>
</tr>
</tbody>
</table>
Appendix 5.

An example of Piril’s Raku Diary
Appendix 6.

Nevin’s Self Evaluation Form

<table>
<thead>
<tr>
<th>Etkinlikler</th>
<th>Evet</th>
<th>Hayır</th>
<th>Komente</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alternatif pişirme tekniklerini tanıdın.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sagar pişirimi tekniğini öğrendim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Raku pişirimi tekniğini öğrendim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Obvara pişirme tekniğini öğrendim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. İсли pişirimi tekniğini öğrendim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. İlk pişirim tekniklерini tanınım.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Etkinlikler arasındaki farkları öğrendim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Sagar, raku, obvara ve işlemen pişirme tekniklerinden yararlanabiliyorum.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Sagar pişirimi tekniğini çalışmalarda kullanabilirim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Raku pişirimi tekniğini çalışmalarda kullanabilirim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Obvara pişirimi tekniğini çalışmalarda kullanabilirim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. İсли pişirimi tekniğini çalışmalarda kullanabilirim.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Çalışmadan sırasında iş güvenliği önlemlerini aldım.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Bu etkinlikler ile bakış açım ve girişimcilik becerilerimi geliştirdi.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Özgün tasarım yapımında seçenekler sunmasının sevdim.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 7.

*Artist-researcher Product Evaluation Form for Buse’s Raku Product*

Bu form aşağıda verilen kriterlere göre alternatif pişirim tekniklerinden İslı pişirim, Raku pişirim, Sagar pişirim ve Obvara pişirim etkinlik çalışmalarını öğretim ve uygulama sürecine yansıtmaları, araştırmacı değerlendirmeleriyle belirlenmeye çalışılacaktır.

<table>
<thead>
<tr>
<th>Ürün Değerlendirme Formu</th>
<th>Süreç İçi</th>
<th>Süreç Sonu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Öğretmen Adayı:</td>
<td></td>
<td>Tarih: 14.11.2023</td>
</tr>
<tr>
<td>Etkinlik:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Araştırmaçı:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ürünle, pişirimin tehnik özelliklerinin yansıtılmaması</td>
<td>Rakeup pişirim; tekniklerin işin form sırasında getirilir ve sınırlarla birleşerek sıralanıp ve masif bir işle sıralanmış-yaşanmış.</td>
<td>Böyüm britlerin bircimde elde edilen formun, pişirimin sonucu işik, darak istenen sonucunun yansıtıldığı.</td>
</tr>
<tr>
<td>Ürünle, pişirim tekniğine uygun biçimsel özellik verme (Yüzey etkisi, renk etkisi, doku)</td>
<td>Uygun birimde işin formu elde edilebilen biçimde işilen formun, işlenen yerin renk ve doku, etkilerin raku pişiriminin sonucunun işleyebilmesi için işlenmesi istenildi.</td>
<td>Uygun birimde işin formu, işilen buçuk birimde işlenmesi için işlenmesi istenildi.</td>
</tr>
<tr>
<td>Pişirim tekniğinin biçim yansıyan teknik oğlunluğu sağlayabilmesi (Ust düzey beceriler, yaratıcılık)</td>
<td>Sıvı kozede dörd yarım bir köşegen bir form kullanılması istendi. Pişirim etkilerini, etkilerinin garyesi, etkilerin daha çok elde edilmesi istendi.</td>
<td>Uygun form üzerindeki etkilerin kullanılması için işlenmiştir ve mümün dönemi, sonuçlanan işlenmiştir.</td>
</tr>
</tbody>
</table>
The Relationship Between Preservice Teachers' Critical Thinking and Epistemological Beliefs

Cafer Çarkıt
Gaziantep University

Hasan Kurnaz
Gaziantep University

Abstract

In this study, the relationship between pre-service teachers' critical thinking dispositions and their epistemological belief perceptions was examined. The relational screening model was used in the study designed in quantitative research approach. The study group of the research is 234 teacher candidates who study at Education Faculties of Gaziantep University and are determined by simple random sampling method. In the study, data were collected with scales developed for two different variables as epistemological belief and critical thinking disposition. SPSS 22.0 packaged software has been used in the process of data analysis. During the research process, the data were evaluated using the arithmetic mean, Pearson Product Moments Correlation Coefficient and multiple regression analysis. In the study, it was determined that the epistemological belief perceptions of teacher candidates differ according to dimensions and their critical thinking dispositions were at a high level. However, positive relationships were determined between sub-dimensions of pre-service teachers' epistemological belief perceptions and sub-dimensions of critical thinking dispositions. Accordingly, a positive and a low level relationship between "access and acquisition of knowledge " and "reasoning" dimensions with "simple knowledge" and "reaching judgment" dimensions; a positive and moderate relationship between 'simple knowledge' and 'reasoning' dimensions were found. In addition, it was determined that 'reasoning', 'open-mindedness' and 'reaching judgment', which are sub-dimensions of the pre-service teachers' critical thinking dispositions; significantly predicted their perception of the epistemological beliefs regarding 'access to knowledge' and 'simple knowledge'.

Keywords: Epistemological Belief, Critical Thinking, Teacher Candidate, Correlation, Relationship Level

DOI: 10.29329/ijpe.2022.426.7
INTRODUCTION

Thinking is seen as an ability that is unique to humans and as old as human history. Thinking is the cornerstone of today's civilization. Thinking is at the center of the common heritage that humanity has carried to the present. Critical thinking is a way of thinking that is seen as the most advanced thinking level among the types of thinking. Thinking gains a critical dimension to the extent of the attention shown to the causes of phenomena or situations emphasized (Bailin & Siegel, 2003). In this framework, when the definitions of critical thinking in the literature are examined, it is seen that critical thinking is characterized by taking a high-level thinking skill that is considered one of the educational roots of the basic reality. As a matter of fact, Paul and Elder (2013) explain critical thinking as a way of thinking that allows access to new knowledge by questioning and evaluating the obtained information and that opens the doors to being autonomous. Tempelaar (2006) defines critical thinking as a metacognition. Similarly, Paul (1993) sees critical thinking as thinking on the act of thinking in order to improve one's own thinking process. Chaffe'e (1991) expresses critical thinking as a collective approach to understanding and solving how the world is given a meaning, rather than just a way of thinking. Yildirim (1997) defines critical thinking as the ability to examine a situation, opinion, explanation, behaviour or value judgment with an objective and rational approach in terms of accuracy and validity, in a measured scepticism. All these knowledge and definitions show that critical thinking is a cause-effect-oriented, multi-dimensional and disciplined way of thinking just like rational thinking.

Critical thinking; seen as a multidisciplinary thinking process that requires both cognitive and affective characteristics in itself and cannot be limited to a specific discipline. As a matter of fact, critical thinking includes affective features such as doubting, searching for evidence, being open-minded, and showing patience in addition to cognitive processes such as sorting, classification, analysis, evaluation, decision making, and problem solving (Alkin-Sahin et al., 2014). In the process of critical thinking, the critical thinker uses certain assessment standards to determine the virtue or value of knowledge, facts, situations or problems (Paul & Elder, 2013). With critical thinking, the individual has the opportunity to make definitive and final judgments about the correctness or falsehood of suggestions and solutions, and the validity or deficiency of ideas (Moore, 2004). In this sense, critical thinking has a structure that meets the logic criteria. Nosich (2015) explains the critical thinking process with the stages of asking questions, grasping the logic of these questions, trying to solve the problems, and believing the results of logic. In this respect, a good critical thinker is expected to have the basic features required by critical thinking.

In addition to the cognitive and affective features of critical thinking, critical thinking disposition emerges as one of the basic features of critical thinking. Disposition is an important factor in the effective execution of a job or skill. In this sense, disposition is expressed as a state of being prone to something (Ennis, 1996). Critical thinking disposition, on the other hand, is defined as the willingness and predisposition of individuals to use a critical view in the framework of certain criteria in the face of events, phenomena, situations or problems they encounter (Zhank, 2003; Gurkaynak et al., 2008). In other words, the way to be a good critical thinker is to have a high-level critical thinking disposition (Facione, 2004). A high-level critical thinking disposition depends on doubting different opinions and beliefs, revealing the reasons for the hypotheses clearly, offering alternative suggestions, having a coherent thinking style, and being brave and determined in seeking the truth (Beyer, 1988). Individuals with high critical thinking disposition can use their critical thinking skills effectively, thus critical thinking training for these individuals progresses systematically.

An important concept related to individuals' critical thinking dispositions and reflecting their beliefs about knowledge and learning is the concept of epistemological belief. Although epistemological beliefs are defined as beliefs of individuals about both knowledge and the nature of acquiring knowledge, they meet the thoughts and beliefs about what knowledge is, how it is acquired, its certainty and limit (Schommer, 1990; Hofer, 2001; Brownlee et al., 2001; Deryakulu, 2014). Epistemological beliefs of individuals have a significant effect on both their cognitive and metacognitive processes (Schommer, 1994). In this context, experienced and critical students believe
that a complete and finalized knowledge cannot exist, but that some of the information will continue to develop, while less experienced students believe that a very small part of the knowledge has changed and developed, and that a large part of the knowledge is completed and takes its final form. Schommer, 1990). In this respect, the level of analysing information with a critical point of view lies in the background of the meaning’s individuals attribute to knowledge and the nature of knowledge. In other words, critical thinking levels are effective in shaping the epistemological beliefs developed by individuals regarding knowledge and the nature of knowledge.

When the literature is examined, it is seen that many studies have been conducted on the epistemological beliefs of teacher candidates (Sinatra & Kardash, 2004; Eryaman, 2007; Yadav & Koehler, 2007; Meral & Colak, 2009; Aypay, 2011; Taskin, 2012; Demir, 2012; Bakir & Adak, 2014; Dunekacke, et al., 2016; Turkan, et al., 2016; Bikmaz, 2017, Koc & Memduhoglu, 2017, Arslan & Aybek, 2018). However, the critical thinking perceptions of teacher candidates have been the subject of many studies (Guven & Kurum, 2008; Sen, 2009; Alper, 2010; Quin, et al., 2010; Kuvac & Koc, 2014; Can & Kaymakci, 2015; Kusaeri, 2019; Saputro, et al., 2020). On the other hand, there is no study in the literature to determine the effect of pre-service teachers’ critical thinking dispositions on their epistemological beliefs and to determine whether these dispositions predict their epistemological beliefs. In this sense, two relevant variables were taken as the subject of this study and the relationship between pre-service teachers’ critical thinking dispositions and their epistemological belief perceptions was examined. In this framework, the problems of the research were formed as follows:

1. What are the pre-service teachers' epistemological belief perceptions and critical thinking dispositions?

2. Is there a significant relationship between the sub-dimensions of pre-service teachers' epistemological belief perceptions and the sub-dimensions of their critical thinking dispositions?

3. Are sub-dimensions of pre-service teachers' critical thinking dispositions a significant predictor of their epistemological beliefs?

**METHOD**

**Research Model**

In this study, which was conducted to examine the relationship between pre-service teachers' critical thinking dispositions and their epistemological belief perceptions, relational scanning model, one of the quantitative research models, was used. Relational scanning is a research model conducted to describe the relationship between two or more variables (Frankel & Wallen, 2009). In studies conducted in the relational screening model, it is possible to examine the relationship between two or more variables without interfering with these variables in any way (Buyukozturk et al, 2014). In this study, it was aimed to determine the relationship between pre-service teachers' critical thinking dispositions and their epistemological belief perceptions. In this direction, scales for determining both variables were applied and the relationship status of these variables was determined by performing the necessary statistical operations.

**Study Group**

This research, was carried out with teacher candidates who continue their studies and voluntarily participate in the research at the Faculties of Education associated with Gaziantep University, located in the South-eastern Anatolia region of Turkey. In quantitative research, a working group suitable for the spirit of the universe is formed (Cohen, Manion & Marrison, 2007; Fraenkel & Wallen, 2009). The study group of the research is 234 teacher candidates selected by simple random sampling among the pre-service teachers who continue their education in Education Faculties of Gaziantep University. The demographic information of the sample is given below.
Table 1. Demographic information of the students who constitute the sample

<table>
<thead>
<tr>
<th>Demographic Features</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>185</td>
<td>79.1</td>
</tr>
<tr>
<td>Male</td>
<td>49</td>
<td>20.9</td>
</tr>
<tr>
<td>17-18</td>
<td>19</td>
<td>8.1</td>
</tr>
<tr>
<td>19-20</td>
<td>94</td>
<td>40.2</td>
</tr>
<tr>
<td>21-22</td>
<td>76</td>
<td>32.5</td>
</tr>
<tr>
<td>23-24</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>25-26</td>
<td>5</td>
<td>2.1</td>
</tr>
<tr>
<td>27 or above</td>
<td>26</td>
<td>11.1</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkish Language Teaching</td>
<td>116</td>
<td>49.6</td>
</tr>
<tr>
<td>Elementary School Teaching</td>
<td>41</td>
<td>17.5</td>
</tr>
<tr>
<td>Social Studies Teaching</td>
<td>38</td>
<td>16.2</td>
</tr>
<tr>
<td>Mathematics Teaching</td>
<td>36</td>
<td>15.4</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Year</td>
<td>86</td>
<td>36.8</td>
</tr>
<tr>
<td>2nd Year</td>
<td>42</td>
<td>17.9</td>
</tr>
<tr>
<td>3rd Year</td>
<td>62</td>
<td>26.5</td>
</tr>
<tr>
<td>4th Year</td>
<td>44</td>
<td>18.8</td>
</tr>
</tbody>
</table>

Data Collection Tools

Data on two different variables as critical thinking disposition and epistemological belief were collected in the study. "Marmara Critical Thinking Disposition Scale" developed by Ozgenel and Cetin (2018) to determine pre-service teachers' critical thinking dispositions, and the "Epistemic Belief Scale" developed by Schraw, Bendixen, and Dunkle (2002) and adapted to Turkish by Dinc, Inel and Uztemur (2016), to determine their epistemological belief perceptions were used. Necessary permissions were obtained to use the relevant scales during the research process. Information on the scales is presented below.

Marmara Critical Thinking Disposition Scale

The scale developed by Ozgenel and Cetin (2018) to determine the critical thinking dispositions of teachers consists of 28 items and 6 sub-dimensions, and is a likert-type scale of 5, rated as “never”, “rarely”, “occasionally”, “usually”, “always”. The structural validity of the scale was tested by explanatory factor analysis (EFA). In order to perform exploratory factor analysis, there must be a certain correlation / relationship between variables. In the calculation of this correlation, the Barlett sphericity test was performed and the Kaiser Meyer Olkin (KMO) value was calculated. As a result of statistical operations, the KMO value was calculated as 0.932, and the Bartlett test result was found = 6476.72 (p<.001) to be significant. As a result of the factor analysis performed within this framework, 28 items and 6 sub-factors were obtained. In this context, the first factor consisting of 6 items was named reasoning, the second factor consisting of 6 items, reaching a judgment, the third factor consisting of 4 items, searching for evidence, the fourth factor consisting of 4 items, searching for truth, the fifth factor consisting of 4 items, open-mindedness, and the sixth factor consisting of 4 items were named as systematicity. The scale consisting of 6 factors explained 56.35% of the total variance. It was determined that the correlation coefficients of the factors were significant. Cronbach's alpha coefficient was calculated for the internal consistency reliability of the scale, and this value for the overall scale was determined as .91. Item-total and item-remaining correlation coefficients were found to be significant, and it was determined that the items were distinctive as a result of the 27% sub-upper independent groups t-test. In the test-retest analysis, it was seen that the correlation coefficients for the sub-dimensions of the scale and the general were significant. As a result of all
these processes, it was concluded that the scale is a valid and reliable scale in determining critical thinking disposition.

**Epistemic Belief Scale**

The scale developed by Schraw, Bendixen, and Dunkle (2002) for determining epistemological belief perceptions was adapted into Turkish by Dinc, Inel, and Uztemur (2016). In order to determine the construct validity of the scale, first exploratory factor analysis and then confirmatory factor analysis were performed. The original of the scale consists of 28 items and 5 dimensions. As a result of the exploratory factor analysis conducted for adaptation to Turkish, it was determined that the scale consists of 4 dimensions and 15 items. In this context, the first factor consisting of 8 items was named the process of accessing and acquiring knowledge, the second factor consisting of 3 items was certain knowledge, the third factor consisting of 2 items was innate ability and the fourth factor consisting of 2 items was named simple knowledge. The scale consisting of 4 factors explained 52.22% of the total variance. Cronbach's alpha coefficient was calculated for the internal consistency reliability of the scale, and this value for the overall scale was calculated as .78. As a result of the confirmatory factor analysis performed to determine the cultural adaptation level of the Turkish version of the scale, it was found that the scale was compatible. Finally, it was concluded that the scale is a valid and reliable scale.

**Data Analysis**

In the analysis of the data obtained during the research process SPSS 22.0 package program was used. Arithmetic mean, standard deviation and standard error in determining the critical thinking levels and epistemological belief levels of the students participating in the study; Pearson Product Moments Correlation Coefficient in determining the relationship between sub-dimensions of epistemological belief scale and sub-dimensions of critical thinking disposition scale; multiple regression analysis calculations were used to determine the predictive power of sub-dimensions of critical thinking disposition on epistemological beliefs. Relevant assumptions for performing regression analysis; sample size, linearity, extreme values, normality, covariance and residual independence were examined. For the sample size, the formula N> 50 + 8m (Tabachnick & Fidell, 2013) was taken into consideration and it was decided that 234 people would be sufficient. In order to determine the extreme values, z scores and Boxplot graphs were examined, and no extreme values (all z scores between +3 and -3) were found in the data set. While examining the assumption of multiple common linearity; The criteria for the correlation between variables to be less than .70, the VIF values to be 10 and the condition index to be less than 30 (Durmus, Yurtkoru & Cinko, 2011) were taken into consideration. These criteria show that there is no multicollinearity problem in the data set. Kurtosis and skewness values and the Mahalanobis distance value were calculated for the single normality distribution. It was observed that the kurtosis and skewness coefficients of the variables ranged between +2 and -2 (George & Mallery, 2016), and the critical values of Mahalanobis distance calculated for 6 independent variables were less than 22.46 (Tabachnick & Fidell, 2013). According to the scatter plot drawn, it shows that the assumptions of no relationship between covariance and error terms were met.

**FINDINGS**

The main purpose of the study is to determine the relationship between pre-service teachers' epistemological belief perceptions and critical thinking dispositions. In this framework, the findings obtained from the analysis of the data collected within the scope of the research were presented in the context of the research questions and in tables. According to this, analysis and findings regarding the sub-problems "What is the level of pre-service teachers’ epistemological beliefs and critical thinking perceptions?" and "Is there a significant relationship between the sub-dimensions of pre-service teachers' epistemological belief perceptions and the sub-dimensions of their critical thinking dispositions?" are shown in Table 2:
The results of correlation analysis to determine the relationship between preservice teachers' epistemological perceptions of belief and critical thinking disposition levels, and these variables (N = 234)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to knowledge</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certain knowledge</td>
<td>.24**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple knowledge</td>
<td>.21*</td>
<td>.21*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innate ability</td>
<td>.37**</td>
<td>.19*</td>
<td>.13*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasoning</td>
<td>.19*</td>
<td>.06</td>
<td>.30**</td>
<td>.10</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reaching a judgment</td>
<td>.02</td>
<td>.10</td>
<td>.22*</td>
<td>.05</td>
<td>.64**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Searching for evidence</td>
<td>-0.01</td>
<td>.01</td>
<td>.10</td>
<td>.00</td>
<td>.59**</td>
<td>.66**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Searching for truth</td>
<td>.02</td>
<td>.01</td>
<td>.08</td>
<td>-0.00</td>
<td>.59**</td>
<td>.66**</td>
<td>.70**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-mindedness</td>
<td>.11</td>
<td>-0.03</td>
<td>.07</td>
<td>-0.02</td>
<td>.41**</td>
<td>.46**</td>
<td>0.44*</td>
<td>.50**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Systematicity</td>
<td>-0.02</td>
<td>-0.02</td>
<td>.09</td>
<td>.07</td>
<td>.50**</td>
<td>.61**</td>
<td>.52**</td>
<td>.53**</td>
<td>.47**</td>
<td>1</td>
</tr>
<tr>
<td>Mean</td>
<td>4.51</td>
<td>4.00</td>
<td>3.32</td>
<td>3.73</td>
<td>4.17</td>
<td>4.12</td>
<td>4.19</td>
<td>4.11</td>
<td>4.18</td>
<td>4.20</td>
</tr>
<tr>
<td>Stand. Dev.</td>
<td>0.48</td>
<td>0.76</td>
<td>1.11</td>
<td>1.06</td>
<td>0.53</td>
<td>0.49</td>
<td>0.57</td>
<td>0.52</td>
<td>0.49</td>
<td>0.52</td>
</tr>
<tr>
<td>Skew.</td>
<td>-1.23</td>
<td>-0.61</td>
<td>-0.07</td>
<td>-0.58</td>
<td>-0.29</td>
<td>-0.18</td>
<td>-0.48</td>
<td>-0.42</td>
<td>-0.34</td>
<td>-0.56</td>
</tr>
<tr>
<td>Kur.</td>
<td>1.23</td>
<td>0.08</td>
<td>-1.02</td>
<td>-0.43</td>
<td>-0.15</td>
<td>-0.10</td>
<td>0.15</td>
<td>0.37</td>
<td>0.42</td>
<td>0.26</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01.

In the interpretation of the arithmetic mean scores in Table 2, it was taken into account that the scales are in the 5-point Likert type. Accordingly, the epistemological beliefs of the teacher candidates participating in the study about access to knowledge are very high (X̄ = 4.51); Beliefs towards certain knowledge (X̄ = 4.00) and innate ability (X̄ = 3.73) were found to be high and their beliefs towards simple knowledge were found to be moderate (X̄ = 3.32). These findings show that teacher candidates' beliefs about access to knowledge are very sophisticated / developed; that beliefs about certain knowledge and innate ability are sophisticated / developed; that their beliefs about simple knowledge are moderately sophisticated / developed.

The scores the teacher candidates obtained from the critical thinking scale; in the dimensions of reasoning (X̄ = 4.17), reaching a judgment (X̄ = 4.12), searching for evidence (X̄ = 4.19), searching for truth (X̄ = 4.11), and open-mindedness (X̄ = 4.18) at a high level; in the systematicity dimension, on the other hand, (X̄ = 4.20) was found to be at a very high level. These findings show that preservice teachers' critical thinking perceptions are at a high level.

Table 2 shows that there are some significant relationships between the epistemological beliefs and critical thinking perceptions of the teacher candidates participating in the study. Accordingly, there is a significant, positive and low level (r =.19, p<.001); relationship between access to knowledge and reasoning; significant, positive and low level (r =.22, p <.001) relationship between simple knowledge and reaching a judgment; a significant, positive, and moderate (r =.30, p <.001) relationship between simple knowledge and reasoning was found. This finding obtained can be interpreted as; as the pre-service teachers' reasoning and judgment reaching levels increased, their beliefs about access to knowledge and simple knowledge beliefs also increased; as their level of reasoning and reaching judgment decreased, beliefs of access to knowledge and beliefs of simple knowledge also decreased. On the other hand, it was observed that the other relationships between the sub-dimensions of the epistemological belief scale and the sub-dimensions of critical thinking skill were insignificant.

Multiple regression analysis was conducted to increase the strength of the findings obtained as a result of the correlation analysis during the research process and to determine whether the sub-dimensions of the pre-service teachers' critical thinking dispositions significantly predicted their epistemological beliefs towards access to knowledge and simple knowledge, and if they did, their predictive power. In this sense, analysis and findings regarding the sub-problem "Are sub-dimensions of teacher candidates' critical thinking skills a meaningful predictor of their epistemological beliefs?", which is the third questioned in the study, are shown in Table 3 and Table 4.
When Table 3 is examined, according to the results of the multiple regression analysis, it is seen that the epistemological beliefs of pre-service teachers about access to knowledge; is significantly predicted by reasoning (β=.35, t = 4.04, p < .001) and open-mindedness (β=.15, t = 1.98, p < .05) which are sub-dimensions of the critical thinking skill. It is observed that sub-dimensions of critical thinking, namely, reaching a judgement (β=.05, t = -.55, p>05), searching for evidence (β=.22, t= - 1.39, p<05), searching for truth (β=-.10, t = -.57, p>05) and systematicity (β=-.25, t = -1.64, p>05) did not significantly predict epistemological beliefs towards access to knowledge. According to the findings, a 1-unit increase in the reasoning sub-dimension of critical thinking, will create a .35-unit increase in pre-service teachers' epistemological beliefs about access to knowledge; and a 1-unit increase in open-mindedness sub-dimension, will create a .15-unit increase in pre-service teachers' epistemological beliefs about access to knowledge. According to the analysis results, 6% of the pre-service teachers' epistemological beliefs about access to knowledge are explained by reasoning and open-mindedness, which are sub-dimensions of critical thinking (adjusted R²=.06; p<.001). According to these findings, it can be said that reasoning and open-mindedness, which are sub-dimensions of critical thinking, contribute to the development of pre-service teachers' epistemological beliefs about access to knowledge.

When Table 4 is examined, according to the results of the multiple regression analysis, it is seen that the pre-service teachers' epistemological beliefs about the simplicity of knowledge; is significantly predicted by reasoning (β=.26, t= 4.32, p<.001) and reaching judgment (β =.15, t= 2.06, p<.05) which are sub-dimensions of the critical thinking skill. It is observed that sub-dimensions of critical thinking, namely, searching for evidence (β=.35, t= -1.14, p>05), searching for truth (β=.25, t= -1.64, p>05) did not significantly predict epistemological beliefs towards access to knowledge. According to the findings, a 1-unit increase in the reasoning sub-dimension of critical thinking, will create a .37 unit increase in pre-service teachers' epistemological belief about the simplicity of knowledge; and a 1-unit increase in the sub-dimension of reaching a judgement will create a .20-unit increase in pre-service
teachers' epistemological beliefs about simplicity of knowledge. According to the results of the analysis, 10% of the pre-service teachers' epistemological beliefs about the simplicity of knowledge are explained by reasoning and reaching judgment, which are sub-dimensions of critical thinking ($R^2=0.10$; $p<0.001$). According to these findings, it can be said that reasoning and reaching judgment, sub-dimensions of critical thinking, contributed to the development of pre-service teachers' epistemological beliefs towards the simplicity of knowledge.

### CONCLUSION AND DISCUSSION

In this study, the relationship between pre-service teachers' critical thinking dispositions and their epistemological belief perceptions was examined. In this framework, first of all, the arithmetic mean of the epistemological belief levels of teacher candidates were evaluated according to their sub-dimensions. Accordingly, it is determined that the epistemological belief levels of teacher candidates participating in the study; very sophisticated in dimensions of access and acquisition of knowledge; sophisticated in the dimensions of innate ability and certain knowledge; moderately sophisticated in the dimension of simple knowledge. These results show that pre-service teachers' epistemological belief perceptions differ according to dimensions. In this sense, the results obtained are in line with the findings of the study conducted by Uztemur and Dinc (2018) on pre-service history and social studies teachers. In the related study, researchers concluded that pre-service teachers' epistemological belief perceptions differ according to dimensions. Similarly, in many studies in the literature, it is stated that epistemological beliefs have a multi-dimensional structure (Schommer, 1990; Hofer, 2000; Conley et al., 2004; Mason et al., 2011; Koseman & Sahin, 2014). In this respect, the research supports the findings of the relevant studies conducted in the literature. According to these results, it is thought that variables such as sociocultural level, family structure, school culture, and reading level are effective on the differentiation of pre-service teachers' epistemological belief levels according to dimensions.

Secondly, in the research process, the arithmetic mean of the critical thinking levels of the teacher candidates were examined according to the sub-dimensions. Accordingly, the critical thinking levels of the teacher candidates participating in the study were high in the dimensions of reasoning, reaching a judgment, searching for evidence, searching the truth and open-mindedness; in terms of systematicity, it has been determined as a very high level. Although these results are in parallel with the results of the studies in which the critical thinking levels of the teacher candidates were determined and the critical thinking levels of the teacher candidates were found to be high (Derinol, 2017; Egmir & Ocak, 2020; Terzi et al., 2020); it differs from the results of the studies in which the critical thinking levels of pre-service teachers were found to be low (Incikabi, et al., 2013; Baran & Balci, 2017; Sartas & Yildirim, 2020). It is observed that variables such as reading levels, socio-cultural levels, philosophical beliefs about education, metacognitive reading awareness, learning styles are effective on the critical thinking dispositions of pre-service teachers (Cansoy et al., 2018). Depending on these variables, it is thought that different results have been reached in the studies presented in the literature.

Thirdly, the relationship between variables was examined in the study. Accordingly, it was determined that there are low and medium level significant relationships between the access to knowledge and simple knowledge dimensions of the epistemological belief scale and the reasoning and reaching a judgment dimensions of critical thinking. Similar to the findings of this study, significant relationships between epistemological beliefs and some dimensions of critical thinking are found in the research results in the literature (Basbay, 2013; Chan et al. 2011; Hofer, 2004; Kandemir and Egmir, 2020; Koyunlu Unlu and Dokme, 2017; Sivgin, 2019). Chan et al. (2011) determined that there is an important link between naive epistemological beliefs and weak critical thinking disposition. In their study, Koyunlu Unlu and Dokme (2017) determined that there are low-level relationships between critical thinking and epistemological beliefs that learning depends on effort and ability. In their study with secondary school students, Kandemir and Egmir (2020) concluded that there are moderately significant relationships between some sub-dimensions of the epistemological belief scale and critical thinking disposition. These findings show that dispositions towards critical thinking are closely related to some dimensions of epistemological beliefs. However, when the studies mentioned are compared, it can be said that the dimensions of epistemological beliefs related to critical thinking
and their level of relationship may differ. These differences seen between studies can be explained by the complex structure of epistemological beliefs. Individuals may develop different beliefs about the source, precision and structure of knowledge, depending on the culture and environment they are in.

Finally, in the study, based on the significant correlations seen between variables, it was examined whether pre-service teachers' critical thinking dispositions significantly predicted epistemological beliefs towards access to knowledge and simple knowledge. Analyzes show that a significant part of the pre-service teachers' epistemological belief variance towards access to knowledge is explained by reasoning and open-mindedness, which are sub-dimensions of critical thinking. In this scale, as the dimension named as access to knowledge contains items from expert authority and rapid learning dimensions from the scale developed by Schraw et al. (2002), it can be said that critical thinking is also related to expert authority and rapid learning. Individuals with sophisticated epistemological beliefs about the source of knowledge believe that the source of knowledge is observation and judgment rather than experts. Similarly, people who have sophisticated beliefs about the pace of learning accept that learning is a gradual process (Schommer-Aikins, 2004; Riedler et al., 2016). In this context, it can be said that individuals whose reasoning and open-mindedness skills are developed, their sophisticated beliefs about the source of knowledge and the speed of learning will also develop. In the studies in the literature, it is seen that there is a two-way relationship between critical thinking disposition and epistemological beliefs. While Basbay (2013) found that critical thinking disposition explains the epistemological belief variance, Akbay, Akbay, and Gulsoy (2018) found that epistemological beliefs significantly explain the variance of critical thinking. As a result, it can be said that the development seen in one of the variables of critical thinking and epistemological belief will reflect positively on the other.

It has been observed that the pre-service teachers' epistemological belief variance towards the simplicity of knowledge, is significantly explained by reasoning and reaching a judgment, which are sub-dimensions of critical thinking. Naive beliefs that knowledge is simple, predispose one to a fixed, one-perspective approach to problems. Sophisticated beliefs that knowledge is complex lead one to think flexible and versatile (Schommer, 1998). Considering that pre-service teachers have a high level of critical thinking disposition in this study, it can be said that pre-service teachers' flexible thinking dispositions are effective on their sophisticated beliefs about the simplicity of knowledge. In this sense, it is thought that pre-service teachers' acumen, reasoning and reaching a judgment skill are effective in increasing the beliefs about the structure of knowledge to the sophisticated level.

As a result, it can be stated that there is an important relationship between having high-level critical thinking skills and having developed epistemological beliefs. However, people with high critical thinking skills may not always have sophisticated beliefs about the nature, structure and source of knowledge. As a matter of fact, in many studies, there is usually a low level of correlation between epistemological beliefs and the sub-dimensions of critical thinking disposition (For example, Koyunlu Unlu & Dokme, 2017). In addition, it is observed that people's high critical thinking dispositions and sophisticated beliefs are not reflected in an equivalent way to their performance (Hyytinen et al. 2014). There are a few limitations that can negatively affect the generalizability of the results obtained in this study. The first of these is that the measurement tools used are in the style of self-report. Another limitation is that the sample used consists of students from similar cultures. In this context, in future studies, different data collection tools can be used to collect data other than self-report style measurement tools. The study can be repeated on samples chosen from different cultures.

REFERENCE


Krystev, M. S., Dinu, R., Efe & E. Atasoy (Eds.) Advances in social science research (pp. 10-29). St. Kliments Ohridski University Press.


Teaching Experiences of Science Teachers Working in Schools for the Visually Impaired

Tamer Karakoç
Gazi University

Cem Aslan
Gazi University

Abstract

This study aims to determine the teaching experiences of science teachers working in schools for the visually impaired. In this context, the instructional arrangements made by the teachers for students with visual impairment in science lessons and the issues they had difficulties with were determined, and suggestions were offered for the effective and efficient implementation of science lessons. A phenomenological design was used in the study, and a sample consisting of 12 science teachers was formed. The interview form was used as the data collection tool, and content analysis was applied to analyse the data obtained. At the end of the research, five themes emerged: lesson plan, material, content presentation, teaching environment, and evaluation. It was determined those science teachers working in schools for the visually impaired made various instructional arrangements for students with visual impairment. In addition, it was determined that teachers had different problems within the framework of these five themes. Thus, some solutions were put forward to overcome these problems and conduct more effective and efficient science lessons. The results obtained were discussed within the scope of the relevant literature, and recommendations were given.

Keywords: Science Teacher, Students with Visual Impairment, Teaching, Instructional Arrangements

DOI: 10.29329/ijpe.2022.426.8

---

1 Tamer Karakoç, Dr., Special Education Department, Gazi University, ORCID: 0000-0002-3080-6326
2 Cem Aslan, Research Assist Dr., Special Education Department, Gazi University, ORCID: 0000-0002-0300-5873

Correspondence: cemaslan@gazi.edu.tr
INTRODUCTION

The main objectives of education include preparing individuals for life and enabling them to react to events in their daily lives. The contribution of science lessons is significant in achieving these goals because students can systematically examine nature and natural phenomena in science lessons (Costu, Unal & Ayas, 2007). To predict unobserved events, they can recognize their surroundings and develop appropriate reactions. To adapt to the world, they live in, they need to observe the environment, establish cause-effect relationships between events, and acquire the skills to reach results. In this context, for students to be beneficial to themselves, their families and society, they can be taught to examine their environment with scientific methods and develop correct thinking and make decisions in events/situations through science lessons (Kaptan, 1998). In other words, students can scientifically research the world they live in thanks to science classes (Carin, Bass & Contant, 2005; Tolman & Hardy, 1999). At the same time, they can be prepared for the future with their decision-making and problem-solving skills and improve their knowledge, understanding, skills, attitudes, and values with the science class (Topsakal, 2005). Science classes aim to raise individuals who can produce knowledge, use it in daily life, think critically, solve problems, be entrepreneurs, have strong communication skills, and contribute to society and culture (Ministry of National Education, 2018).

Today, individuals are faced with many complex problems. Therefore, to overcome these problems, they need to acquire some skills and have 21st-century skills that provide a universal literacy framework (Akgunduz et al., 2015). Students must develop these skills, especially acquiring competencies in the science program (Bahar, Yener, Yilmaz, Emen & Gurer, 2018). In addition, the science course is at the top of the lessons in which these skills are taught, and it plays a key role (Yilmaz et al., 2008).

In today's world, where knowledge and technology are developing very rapidly, there is a need for individuals who have problem-solving and decision-making skills based on science and technology in every field. Therefore, science education is essential for each student. In this respect, it is necessary to provide all students with the knowledge, attitude, or skills required by the age, whether they have any disabilities or not. In short, science education is necessary for all students, and no discrimination should be made on gender, culture, disability, etc. (Topsakal, 2005). In this context, science lesson has an important place in the education of students with visual impairment and all students. Students with visual impairment may have limitations in learning processes and cognitive development due to reasons arising from their lack of vision (Sozbilir et al., 2017). Therefore, they may experience more difficulties than their peers who study, especially in courses requiring field knowledge (Kandaz, 2004). In particular, they may have more problem in science lessons where visual information is used extensively (Karakoc, 2016). In addition, the science curriculum contains a large number of abstract topics, concepts, or knowledge. This situation may cause students with visual impairment to have difficulties in science classes (Lang, 1983; Zorluoglu & Kizilaslan, 2019). Students with visual impairment need more concretization to access abstract contents in science classes (Gursel, 2011; Tuncer, 2005). In other words, the presentation of content and the use of materials to be prepared by considering the readiness of students with visual impairment are crucial for them to gain more experience.

Researchers argue that students with visual impairment need a rich environment to gain diverse and continuous experiences and opportunities to learn by doing and living (Koenig & Holbrook, 2000; Lowenfeld, 1974). It is estimated that sighted students learn about 85% of their academic, social, and functional skill areas through the sense of sight (MasCuspie, 1992). Therefore, unique methods and techniques are needed in the education of students with visual impairment (Koenig & Holbrook, 2000; Lowenfeld, 1974). For example, students with visual impairment need to use their remaining senses other than sight to systematically explore the contents of science classes. In addition, students with visual impairment need to learn, primarily through tactile and auditory means (Lowenfeld, 1974). In other words, they need tactile and auditory materials and visual materials to participate effectively in educational activities (Yalcin & Kamali Arslantas, 2020). Accordingly, it can be said that it is essential for science teachers to make some adaptations in the materials or course contents to enable students with visual impairment to access the curriculum (Zorluoglu, Sozbilir &
Kizilaslan, 2016). Science teachers should choose appropriate teaching activities and use proper materials or make some adaptations in materials (Cavkaytar & Diken, 2012; Sozbilir, Gul, Okcu, Kizilaslan, Zorluoglu & Atilla, 2015). Adapting the materials or content delivery used for students with visual impairment means that these students have a great chance to achieve academic success (Rooks, 2009). From this perspective, we can say those science teachers who carry out teaching activities for students with visual impairment are of critical importance.

In Turkey, the same curriculum is applied to students with visual impairment and their sighted peers (Cakmak, Yilmaz & Isitan, 2017; Sozbilir et al., 2017). This situation is also valid for the science program. Science lessons are carried out by the in-field teachers who graduated from the relevant field. Even though it is a school for the visually impaired, in-field teachers give science lessons. Therefore, science teachers who work with students with visual impairment have essential duties because making instructional arrangements for students with visual impairment is directly under the teacher's responsibility to conduct the lesson (Yalcin, 2020). For example, these responsibilities include the adaptation of the content, appropriate teaching materials, the use of different teaching methods and techniques, or assessment and evaluation. However, we should also point out that although science teachers have many responsibilities, they are equally likely to have difficulties. Science teachers receive a general education during their college education, and therefore they lack the idea of adapting the content for students with visual impairment (Fraser & Maguvhe, 2008). When the curriculum of the universities that train science teachers in Turkey is examined, there is a lesson called "special education and inclusion" (Council of Higher Education, 2018). The lesson's content in question generally includes special education subjects and students with visual impairment to a limited extend. Accordingly, it can be said that science teachers have limited knowledge about students with visual impairment. This situation will cause science teachers assigned to schools for the visually impaired to feel ineligible and have difficulties in teaching activities. Islek (2017) states that the in-field teachers working in the school for the visually impaired are assigned without any special training; they consider themselves inadequate in the education of students with visual impairment and that there are fundamental problems in academic lessons. According to Yazici (2017), science teachers are hesitant about science lessons with students with visual impairment and generally prefer verbal expression. Based on this, we can state that science teachers working with students with visual impairment should be supported to teach effectively. Kumar, Ramasamy & Stefanich (2001) says that teacher training is an effective way for more accessible science education. They also suggest that science teachers should be taught how to teach science to students with visual impairment through in-service training activities.

In the literature, there are studies about the experiences of educators working with students with visual impairment. When these studies are examined, Erwin, Perkins, Ayala, Fine & Rubin (2001) investigated teachers' experiences regarding how students with visual impairment were supported in natural learning environments with a structured curriculum and adapted materials. Researchers stated that science teaching should be presented to students with visual impairment with a multi-sensory approach to obtain positive benefits about tactile and auditory interactions. In a similar study, Fraser & Maguvhe (2008) examined the experiences of science teachers working with students with visual impairment. According to the research results, it was determined that using teaching plans designed or adapted for students with visual impairment increased the success of these students in science class. Using the mixed method, Islek (2017) examined the views of 13 educators and 12 students with visual impairment and compared their experiences in the context of the academic program and expanded core curriculum applications. It was revealed that teachers had difficulties in lessons or subjects with visual content. In another study, Kumar et al. (2001) analyzed science teachers' policy implications for teaching, alternative assessment, educational technology, and adaptations for students with visual impairment. According to the research results, it was suggested to use natural objects so that students with visual impairment can feel by touching, allowing them to explore some subjects in natural environments and provide hands-on learning experiences. In the research conducted by Wild & Allen (2009), a political analysis of science-based best practices for students with visual impairment was conducted. Researchers demonstrated that using a curriculum designed or adapted for students with visual impairment increases the success of these students in
science and that science teacher should be well supported. Zorluoglu et al. (2016) examined the views of academicians on the creation of scientific literacy in students with visual impairment. According to the research results, it was emphasized that activating the senses other than sight was effective in teaching concepts to students with visual impairment and increased success. The present study is essential in determining the difficulties faced by science teachers working in schools for the visually impaired and finding solutions based on their experiences. In addition, it is considered necessary in terms of revealing the instructional arrangements to be made in the teaching of science lessons to students with visual impairment. The results obtained from this study can provide important information about revealing the necessity of revising the content of the special education and inclusion course in the science teaching undergraduate program. On the other hand, the research findings may help science teachers who are or may work with students with visual impairment to develop their opinions. In addition, it is thought that it will support the limited number of studies conducted in the literature on science teachers working with students with visual impairment and contribute to the knowledge. This framework aimed to determine the teaching experiences of science teachers working in schools for the visually impaired. For this purpose, it was aimed to find solutions for the instructional arrangements made by teachers for students with visual impairment in science classes, the subjects they have difficulties with, and the effective and efficient conduct of science lessons.

**METHOD**

**Research Design**

Phenomenology, one of the qualitative research methods, was employed in the study. The phenomenological model is aimed to reveal the perception, experience and meanings that individuals attribute to an event based on real experiences (Yıldırım & Simsek, 2014). In this study, the phenomenological research model was chosen as it was aimed to examine the teaching experiences of science teachers working in schools for the visually impaired in depth.

**Participants**

Participants of the study consisted of science teachers working in schools for the visually impaired. According to the Ministry of National Education (2020) official statistics, there were 18 schools for the visually impaired in Turkey in the 2019-2020 academic year. In this context, it was aimed to reach the entire scope of the study in the research, so no sample selection was made. Five of the science teachers working in these schools stated that they did not want to participate in the study, and one was not included in the sample due to his health condition. For these reasons, 12 science teachers were included in the study sample, three of whom are male, and nine are female. The ages of the participants vary between 30 and 60, with an average of 42.5. While two participants have a Master’s degree, the remaining 10 participants have Bachelor’s degree. The average teaching experience of the participants is 17.7 years (Min: 9, Max: 29) and the average duration of teaching at the school for the visually impaired is 9.9 years (Min: 3, Max: 22). Detailed information about the participants is presented in Table 1.

<table>
<thead>
<tr>
<th>Code</th>
<th>Gender</th>
<th>Age</th>
<th>Education Status</th>
<th>Total Teaching Experience (year)</th>
<th>Teaching Time at the School for the Visually Impaired (year)</th>
<th>Interview Date</th>
<th>Interview Duration (minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Female</td>
<td>40</td>
<td>Bachelor</td>
<td>19</td>
<td>8</td>
<td>26.02.2021</td>
<td>19</td>
</tr>
<tr>
<td>T2</td>
<td>Female</td>
<td>32</td>
<td>Bachelor</td>
<td>9</td>
<td>5</td>
<td>27.02.2021</td>
<td>15</td>
</tr>
<tr>
<td>T3</td>
<td>Female</td>
<td>52</td>
<td>Bachelor</td>
<td>26</td>
<td>10</td>
<td>28.02.2021</td>
<td>15</td>
</tr>
<tr>
<td>T4</td>
<td>Female</td>
<td>34</td>
<td>Master’s</td>
<td>13</td>
<td>9</td>
<td>29.02.2021</td>
<td>24</td>
</tr>
<tr>
<td>T5</td>
<td>Female</td>
<td>33</td>
<td>Master’s</td>
<td>9</td>
<td>6</td>
<td>01.03.2021</td>
<td>15</td>
</tr>
<tr>
<td>T6</td>
<td>Male</td>
<td>42</td>
<td>Bachelor</td>
<td>17</td>
<td>3</td>
<td>06.03.2021</td>
<td>22</td>
</tr>
<tr>
<td>T7</td>
<td>Male</td>
<td>48</td>
<td>Bachelor</td>
<td>22</td>
<td>18</td>
<td>01.03.2021</td>
<td>25</td>
</tr>
<tr>
<td>T8</td>
<td>Female</td>
<td>56</td>
<td>Bachelor</td>
<td>23</td>
<td>15</td>
<td>05.03.2021</td>
<td>18</td>
</tr>
<tr>
<td>T9</td>
<td>Female</td>
<td>60</td>
<td>Bachelor</td>
<td>29</td>
<td>15</td>
<td>07.03.2021</td>
<td>26</td>
</tr>
</tbody>
</table>
Data Collection Tool

The interview form consisting of two parts was developed and used as a data collection tool in the study. The first part aims to gather information about the participants and includes gender, age, education status, total teaching experience, and teaching time in a school for the visually impaired. In the second part, there are open-ended questions to determine the teaching experiences of science teachers. The questions were designed so that teachers’ instructional arrangements for students with visual impairment in science classes, the subjects they had difficulties and suggestions for the effective and efficient conduct of science lessons were obtained. In the development of the interview form, the literature was first reviewed by the researchers and draft interview questions were prepared (Batmaz, 2017; Cay & Yikmis, 2020; Korkmaz Ersan & Sommez-Kartal, 2020; Kot, Sonmez, Yikmis & Ciftci Tekinarslan, 2015; Metin & Altunay, 2020; Vural & Yikmis, 2016; Yonter, 2009; Zorluoglu et al., 2016). Draft questions were organized to serve the research purpose. Then, expert opinion was taken to evaluate the questions regarding their suitability for purpose, clarity, and comprehensibility. Expert opinions were also received through a form. Along with this form, interview questions were sent to seven field experts with a doctoral degree via e-mail, and they were asked to evaluate the interview form. Four of them are field experts in science teaching to the visually impaired, two in general science teaching, and one in qualitative research. Experts conveyed their evaluations to the researchers via e-mail. Arrangements were made in the interview form, taking into account the opinions and suggestions received. In addition, some questions suggested to be changed were corrected, and expert opinion was sought again. In the last stage, a pilot interview was conducted with a science teacher who was not among the study participants but had experience working with students with visual impairment. After this meeting, a change was made in one item to make it more straightforward.

Data Collection

The researchers completed the data collection process of the research in the 2020-2021 academic year. We conducted interviews with science teachers between the dates of 26.02.2021–12.03.2021. Since the participating teachers were in different cities, time and cost concerns, and the COVID-19 pandemic, which is particularly intense in our country, the research data were collected online via Zoom. Firstly, the teachers were reached by phone and information was obtained about whether they could participate in the study or not. An appointment was made for online interviews with the teachers who agreed to participate in the study. On the day and hour of the interview, the relevant teachers were invited to the interview by sending a Zoom link. Both researchers conducted interviews with participants. Before starting the interview, teachers were informed about the purpose and scope of the research and permission was asked to record the interviews. Teachers were assured that their personal and school information would be kept confidential, that codes would be used instead of real names in the study, and a participant consent form was used for this. The researchers interviewed each teacher one-on-one, and each interview took an average of 19 minutes (Min: 15, Max: 26). The researchers recorded all interviews. At the end of the meeting, the interviews were concluded by thanking the teachers for their participation.

Data Analysis

The researchers used the content analysis technique in the analysis of the data. Content analysis is defined as an effective method in classifying and comparing texts to make theoretical inferences (Cohen, Manion & Morrison, 2007). In this context, the opinions of science teachers who took part in the study were analysed in detail. Some themes and sub-themes were reached as a result of the analysis. These themes are presented under the headings of instructional arrangements made by science teachers for students with visual impairment, issues they have difficulties with, and solution suggestions for the effective and efficient conduct of science lessons. The authors coded the
interviews, and the themes reached were agreed upon. Different views were resolved through discussion. The themes obtained were supported by quoting some of the teachers' responses. In addition, the results obtained were shared with the teachers and participant confirmation was received.

**FINDINGS**

The findings of the interviews with science teachers, as obtained from the content analysis, are presented under five themes: a) Lesson plan, b) Material, c) Content presentation, d) Teaching environment, and e) Evaluation. The instructional arrangements made by science teachers regarding these themes, the issues they have difficulties with, and the number of teachers' who gave opinions were also included.

**Theme 1: Lesson Plan**

The opinions of science teachers working in schools for the visually impaired about the lesson plan are presented in Table 2. Units of analysis consisted of six components.

<table>
<thead>
<tr>
<th>Instructional Arrangements</th>
<th>Challenging Issues</th>
<th>Solutions for Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating your own plan. (3)</td>
<td>Plans are inefficient. (1)</td>
<td>The program for the visually impaired should be changed. (6)</td>
</tr>
<tr>
<td>Making plans for the needs. (2)</td>
<td>Lesson hours should be increased. (2)</td>
<td>Group meetings should be held separately. (1)</td>
</tr>
</tbody>
</table>

When science teachers' opinions about the instructional arrangements they make in the lesson plan for students with visual impairment are examined, it was determined that teachers created their programs or made plans according to the needs (n=2). T9 said, "I apply the plans I have created myself." and T8 said, "We need to make a separate plan for our students."

Only one teacher (T11) stated that the plans were inefficient regarding the subjects they had difficulty, and said, "The planning in the lessons is inefficient."

Science teachers focused more on changing the curriculum for the students with visual impairment for the effectiveness of lesson plans. The following statements can exemplify opinions on this subject: "In order to be more successful, there must be some changes in the curriculum. We shouldn't be forced to complete the units. Different things can be done. It can be more efficient if different subjects are put." (T8); "The gains must be optional. Some revisions can be made in the acquisitions. It can be screening, sorting, or converting to a different size. The program should be reevaluated for students with visual impairment." (T1); "My suggestions are that the annual plans should be different for us. Not every subject should be told to children." (T3).

Opinions were expressed that the course hours should be increased as an effective solution. On this issue, T7 said, "For the students with visual impairment, at least two more hours should be given for the laboratory or lesson. It should be 6 hours, not 4 hours."; T12 said, "The lesson hours can be increased for the students with visual impairment to be able to do activities because it takes at least 10 minutes for us even to enter the lab. It is troublesome in terms of time to go there together, examine the items there and explain how we can use them." T9 stated that the meetings should be held separately and said, "We organize the group meeting. But it should not be with the school near us. We should do it with the other school for the visually impaired. What normal schools do does not match ours."

**Theme 2: Material**

The opinions of science teachers working in schools for the visually impaired on the use of materials are summarized in Table 3. Units of analysis consisted of 13 components.
When the opinions of science teachers about the instructional arrangements they make about materials for students with visual impairment were examined, it was seen that almost all of the teachers stated that they prepared materials (n=11). More than half of them used tactile material (n=7). One of the teachers who stated that he prepared teacher-made materials, T12 said, "I mostly prepare the materials myself."; T8 said, "I am trying to make materials."; and T4 said, "I am making my materials myself.". The opinions of teachers who use tactile materials can be exemplified as follows: "I attach importance to tactility in materials." (T2); "There is a cardboard, a material called Eva, I made things out of felting to activate them to touch. For example, I made a periodic table. I wrote in braille." (T4); "I prepare the materials by creating textures with silicones and Eva papers." (T12).

In addition, some teachers stated that they used ready-made materials, included students in the material preparation process, and selected materials suitable for the plan. Commenting that he used ready-made materials, T3 said, "Materials come from various places. We distribute them."; T4, who prepared materials with the students, said, "I get help from my students, I make it with them."; and T2 said, "I arrange the materials according to the plan.”

Material inadequacy was emphasized as the most challenging situation by science teachers. The following statements can exemplify this situation: "The material prepared as braille in our school is minimal." (T1); "Our materials are very limited, almost non-existent. We have many problems with equipment. We have almost nothing at school." (T2); "Our material is incomplete." (T6); "There is not much material in our school." (T7). Expressing that they could not get enough support in addition to the lack of material, T2 used the following statement: "Unfortunately, our government does not give much support." Another factor that teachers have difficulties with regarding material is the time allocated to prepare the material. T7's statement, "It takes time to prepare the materials related to the lesson." is an example of the difficulty experienced. However, another challenge is that the prepared materials are not durable. This difficulty was expressed by two teachers as follows: "The child does not know, when touched hard, the material breaks immediately. I can't use it on a second child. Sometimes it gets harmed quickly. I can't use it later." (T2); "We can only use what we have made. There is no more material that we can use for the second time." (T7).

Almost all of the teachers (n=11) emphasized that adequate material support should be provided. In this regard, T1 said, "You cannot use a single instrument in a classroom. The material should be used more or less for each student or a specific person and individually."; T5 said, "It would be great if material support was provided to us to make the lesson more effective. Our job would also get easier. It might be better if ready-made tools and equipment for the students with visual impairment are brought to us." and T8 said, "The number of our materials should be increased." Five of the teachers stated that in order to conduct effective and productive lessons, materials suitable for the students with visual impairment should be used. T7’s statement can exemplify this situation: "For students with visual impairment, certain materials must be available, designed, and produced suitably for certain gains." In addition, some teachers stated that the materials used should have a standard. For example, T1 made the following statement on this subject: "There must be a standard. For example, while explaining the subject of pressure, there should be a standard for the material that it must be designed to use while explaining the fluid pressure to that student.” Finally, teachers’ opinions on making use of technological materials were obtained.
Theme 3: Content Presentation

The opinions of science teachers working in schools for the visually impaired on content presentation are given in Table 4. Units of analysis consisted of 21 components.

Table 4. Opinions on Content Presentation

<table>
<thead>
<tr>
<th>Instructional Arrangements</th>
<th>Challenging Issues</th>
<th>Solutions for Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilizing the sense of touch. (12)</td>
<td>Having difficulty in some topics. (9)</td>
<td>Different teaching methods and techniques should be used. (4)</td>
</tr>
<tr>
<td>Describing the content. (10)</td>
<td>Abstractness of the course content. (8)</td>
<td>Teachers at school for the visually impaired should be trained. (4)</td>
</tr>
<tr>
<td>Doing the activity even if they do not see it. (8)</td>
<td>Inability to benefit from visual content. (6)</td>
<td>Teachers should improve themselves. (4)</td>
</tr>
<tr>
<td>Learning by doing/experiencing. (8)</td>
<td>Inability to do all activities. (5)</td>
<td>Topics should not be skipped. (2)</td>
</tr>
<tr>
<td>Using animation/models. (8)</td>
<td>Inability to complete the curriculum. (3)</td>
<td>Should be adjusted to the level of student. (2)</td>
</tr>
<tr>
<td>Dealing with each student individually. (5)</td>
<td></td>
<td>A special teacher should be selected for the school for the visually impaired. (2)</td>
</tr>
<tr>
<td>Using different teaching methods. (5)</td>
<td></td>
<td>Content should be concretized. (1)</td>
</tr>
<tr>
<td>Using the senses other than sight. (2)</td>
<td></td>
<td>Teacher should make student love the lesson. (1)</td>
</tr>
</tbody>
</table>

When Table 2 is examined, it is seen that various instructional arrangements have been made for students with visual impairment regarding the content presentation. All of the science teachers participating in the study (n=12) stated that they used the sense of touch while transferring the course contents. About this issue, T2 stated, "We teach the students with visual impairment by making them touch all the time. If the child does not touch, he definitely cannot understand."; T3 said, "We use one-to-one teaching method by touching."; and T4 said, "I explain the subject by making the student touch it. I make the students touch everything. There is nothing in our lab without fingerprints." In addition to touching, the majority of teachers (n=10) describe the content. Quotations from teachers' statements regarding the description are as follows: "We carry out experiments based on seeing by describing them. For example, the temperature in the thermometer beaker is increasing; it is now 60 degrees. I'm describing by saying -the temperature is rising, it is in eighty.-" (T1); "We make verbal descriptions for the students with visual impairment. It is necessary to vocalize a voltmeter. If there is an event, we need to describe it. In a way that the student will understand. For example, if it is an issue with electricity, electricity issues the devices speak, that is, it measures volts, but by having it tell 5 ml or 3 volts." (T2); "I'm describing the experiments to them. I describe it as this is done like this." (T13). Two teachers stated that senses other than sight were used. Opinions on this subject are, "We conduct experiments in a way that appeals to other sensory organs other than vision. Planning is done in a way that it appeals to other senses." (T1); "The main point is how we can explain the subject of science in relation to the four senses when one sense is missing. While teaching the concepts in science to the students with visual impairment, we try to appeal to the four senses. This is the most fundamental point I see. If we appeal to all the senses, we will make learning easier. For example, we cannot realize learning when the student does not touch, does not smell, and cannot examine different shapes with his hand." (T10).

Some of the teachers stated that they used different teaching methods and techniques while presenting the course content. T1 said, "I try to teach everything by making drama and gamification. I make up too many stories. As if I was living in my daily life. They are also laughing and having fun. I try to set the subject in their minds with the stories"; T3 said, "We try to solve it by playing games and dancing" However, most teachers emphasized that they practice learning by doing/experiencing (n=8) and using animation/models (n=8). Expressing that he used knowledge by doing/experiencing, T2 said, "We mostly practice doing and living. We have the lesson with continuous activities."; T10 noted, "For example, you will explain the concept of force. How can we explain this by doing and living? For example, we need to give the concept of direction so that we can take our student and explain the properties of the force. We have to give the effect, the reaction by touching, pulling and pushing. We have to show it by doing and living. It's like pushing and lifting a row." One of the teachers who used animation/modelling applications in the content presentation, T1, said, "Animation or working on a model is done in a way that supports that acquisition."; T7 said, "Since science is a lesson about
nature, you need to model it. This situation attracts both the attention and interest of the student.”; T_{10} said, "We explain the concepts through modelling."; T_{12} said, "I always explain the systems through body models. While I am describing the states of matter, I press them close. Solid particles are like this, I say, and I decompose a little more in liquid. In gas, they are both mobile and separate; I mean, I try to involve students.”

Most of the teachers (n=8) stated while presenting the course contents. They do the activities even if students do not see them. For example, T_{1} said, "The student does not see, but I still experiment in the classroom." Regarding the adaptations, T_{5} said, "I especially introduce the microscope in science applications. I introduce the lamella. But I try to get people with low vision to find images. Even if he sees little, he cannot see; he says, 'I saw it, there is something there, teacher'. I also say ‘yes, right. There is. It looks like a square, like a rectangle, right?’ I do these kinds of applications to motivate students with low vision," and T_{8} said, "For example, we mix water and olive oil. Oil stays on top. I see this. The child does not see. What is happening? The child keeps this in mind. Or we mix water with salt. It evaporates. There's salt left in the bottom of the bowl, I say. It feels like I'm stirring, lighting the stove. He feels the salt remaining at the bottom by touching it with his finger. He says there is salt left. We are trying to make such adaptations.” In addition to these, five of the teachers stated that they took care of each student individually while carrying out the activities. Example expressions on this subject are as follows: "I start with the student in the first row, go one by one, I do the study one by one until I get to the last student." (T_{1}); "Since the number of students is small, you always have the chance to work individually." (T_{4}); "Since I have few students, we are in one-to-one communication. I call the children one by one in each process.” (T_{5}).

Science teachers emphasized that they had difficulties, especially in some topics. While these topics are shown in Figure 1, the opinions of the teachers are as follows: "Topics related to light and reflection. It is complicated to adapt these topics to them. For example, colours, a third colour that emerges from the combination of two colours, is very memorable.” (T_{1}); "I have a hard time in simple machines, heat and temperature issue. Students have a hard time understanding the size of the planets. They have difficulty understanding the distance of the moon to the world. They can't understand spatial things.” (T_{2}); "We are having a hard time with light. I have trouble explaining the subject of colour.” (T_{3}); "The most problematic issue is the light. Absorption of light, the formation of colours, the laws of reflection, shadow formation are the issues that I have difficulty with. We're talking about simple machines, but we're having trouble.” (T_{8}).

Figure 1. Issues that Teachers Have Difficulty

The teachers stated that they had difficulties due to the abstract nature of the course content. In this regard, T_{1} said, "Some of the achievements remain very abstract, and it is a little difficult to teach. It is not even a little, it is quite a problem." and T_{7} said, "It is difficult to explain abstract things to students with visual impairment.” However, while teachers emphasized that visual content could not
be used, T_7 said, "It is difficult to explain the subject. We are teaching a simple subject, but what is easy for sighted ones is difficult for the students with visual impairment. There is some difficulty in science because there are no things to see for the students with visual impairment." Because of these situations, it is seen that teachers do not carry out all the activities in the content and cannot complete the curriculum. T_3's statement, "Of course, we cannot do some experiments. Our students with visual impairment cannot do some experiments." This can be given as an example of this situation. Teachers' failure to complete the curriculum is associated with short course hours. Opinions on this subject are as follows: "Time is insufficient for students with visual impairment. In addition, it is not good to have to do the same activity with each of them while the process continues in terms of using Time efficiently. It takes a lot from the lesson." (T_1); "General theoretical knowledge in science. When there is no material while explaining the non-theoretical, we have difficulties in practice. The normal curriculum cannot be conducted in 4 hours. It is not possible to complete the topics." (T_7); "Four lessons are not exactly enough." (T_12).

The solutions offered by teachers to conduct effective and efficient lessons for students with visual impairment vary. For example, it is recommended to use different teaching methods and techniques to present the content. T_4 said, "It is necessary to use the drama method." Stating that the subjects should not be skipped for students with visual impairment, T_1 said, "All should be done without skipping. One cannot say that it is unnecessary because they do not see.;" T_11 said, "It is useful to do all activities for students with visual impairment." In addition, opinions were obtained regarding the need to adjust the lesson to the students' level and concretize the content. Statements on this subject can be exemplified as follows: "Students with visual impairment can be distracted very quickly. It is important to be able to determine their needs well. It is necessary to benefit from the experiences of their daily lives. We should adjust to the level of the student." (T_4); "The activities we will do should be adjusted to the level of the student." (T_10); "I think the experiments done should be made morere donecrete." (T_11).

Another component that teachers offer as a solution is related to the teachers who teach the lessons. Accordingly, it was found that the teachers working in the school for the visually impaired should be trained, specially selected, and they should improve themselves. For example, T_2 said, "Science teachers must be supported or trained."; T_9 said, "Students with visual impairment should receive an education. The teacher needs to be trained. It should take at least one year of training. The teacher who will come here should pass the course.;" and T_11 said, "Science teachers need to be supported with workshops and support training." T_9 suggested selecting teachers who will work in schools for the visually impaired by saying, "The teacher who will work here should be a chosen one." Finally, it was seen that there were suggestions for teachers to improve themselves. On this subject, T_1 said, "The primary condition for the development of our students is that teachers should improve themselves."

Theme 4: Teaching Environment

The opinions of science teachers working in schools for the visually impaired on the teaching environment are shown in Table 5. Units of analysis consisted of five components.

<table>
<thead>
<tr>
<th>Instructional Arrangements</th>
<th>Challenging Issues</th>
<th>Solutions for Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of different environment. (3)</td>
<td>Small classrooms. (1)</td>
<td>Lessons should be conducted in the lab. (1)</td>
</tr>
<tr>
<td>Organizing the environment according to the course content. (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using U-Shape pattern. (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the opinions of science teachers about the instructional arrangements made in the teaching environment for students with visual impairment are examined, it is seen that the teachers use different settings (n=3), arrange the environment according to the course content (n=3), and use the U-Shape (n=1). T_4 said, "I prefer to use the garden. I used the school's conference room in freezing weather.;" T_12 said, "We did experiments related to pressure in the open air." According to the course
content, one of the teachers who arrange the environment according to the course content, T_1 said, "I prepare a learning environment according to the needs."; T_2 said, "I set the classroom environment according to the lesson. For example, I say, 'consider the classroom like the sun. I bring a walnut and say think of it as the world.'" Only one teacher expressed the view that the classroom was small and said, "We had a hard time because our classes are tiny." (T_4). As a solution proposal for the teaching environment, a teacher gave his opinion and stated that the lessons should be taught in the laboratory. His view is as follows: "Science laboratories must be mandatory in schools. It would be much better if the lessons could be taught in laboratories more." (T_11).

**Theme 5: Evaluation**

The opinions of science teachers working in schools for the visually impaired regarding the evaluation process are presented in Table 6. Units of analysis consisted of 15 components.

**Table 6. Opinions on the Evaluation Process**

<table>
<thead>
<tr>
<th>Instructional Arrangements</th>
<th>Challenging Issues</th>
<th>Solutions for Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher reads the questions. (9)</td>
<td>Student performances are not the same. (7)</td>
<td>Arrangements should be made according to exams. (8)</td>
</tr>
<tr>
<td>Use of technology. (5)</td>
<td>Exams take a long time. (5)</td>
<td>Alternative assessment should be used. (2)</td>
</tr>
<tr>
<td>Not asking visual questions. (4)</td>
<td>Parent factor. (5)</td>
<td></td>
</tr>
<tr>
<td>Preparation easy questions. (4)</td>
<td>Problem of preparing questions and reading answers. (4)</td>
<td></td>
</tr>
<tr>
<td>Braille exam preparation. (4)</td>
<td>Difficulty with questions with visual content. (3)</td>
<td></td>
</tr>
<tr>
<td>Getting help from a teacher who knows braille. (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having another student read the answers. (2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The instructional arrangements made by science teachers during the evaluation process vary. For example, in the evaluations, it is seen that the questions are read by the teacher (n=9) or braille exams are prepared (n=4). As an example of the views that the teacher read the questions, the following comments were made: "I am reading the questions." (T_1); "I read the papers, I read the question and the options." (T_2); "I'm reading the questions. I read it three or four times until the students answer within a certain time." (T_4); "I'm reading the questions to the children." (T_5). The opinions of teachers who prepare braille exams are as follows: "We have a printer with braille alphabet. There, questions can be printed out." (T_3); "Exams are in braille. We prepare on Word and take a printout from the printing machine in our school and deliver it to our students." (T_8).

While preparing the evaluation questions, teachers try not to ask visual questions (n=4) and prepare easy questions (n=4) for visually impaired students. In this regard, T_8 said, "Our questions are not visual."; T_10 noted, on the other hand, "They are exempt from the shape questions in evaluation." T_3 said, "I usually ask about the writings from the book." Again, different applications were encountered on the subject of receiving students' answers and reading these answers. More than half of the teachers receive the answers by asking students to write them. Their views can be exemplified as follows: "Students take their braille tablets and pens and write." (T_4); "They have devices. They put on their headphones. They solve the questions. Or their typewriters are in front of them. They use their braille typewriters." (T_1). In reading the answers, the practices of having another student read the answers and getting help from a teacher who knows braille were observed (n=2). Regarding having another student read, T_3 said, "I ask a student with visual impairment to read the question. I write down the answers. I score the student accordingly." Opinion of T_3, who stated that he received help from a teacher who knew braille, is as follows: "I ask the visually impaired teachers in our school. In our spare time they read to me and I score." (T_3).

The most challenging issue for teachers in the evaluation process is that student performances are not the same. Seven teachers emphasized this situation, and their opinions are as follows: "In our school, there are children who do not know braille and cannot learn because of their mental processes. Some do not have perfect intelligence. Some students say they cannot read the article they have written themselves." (T_2); "Each student's capacity is different. If there are six students in the
class, there are three levels. Their perceptions are different. For two students, everything can be solved by speaking normally, but nothing works for two of them." (T8). Another problem is that the exams take a long time. On this subject, T3 said, "There are usually two lessons allocated for exams." T7 said, "Sometimes it takes 20-25 minutes for a question. Since the science lesson is 4 hours, it is a serious process when you think that we should complete the topics to be taught." The issue of preparing questions and reading the answers is also seen as a problem by science teachers. For example, T3 said, "They have difficulties in such questions with graphs because they cannot read them."; T1 said, "When you prepare even a short question in braille, it can take a couple of pages, especially for new generation questions."; and T4 said, "We also have problems in reading the answers."

Science teachers put forward two suggestions to make the assessment process more effective and efficient. These are the use of alternative assessment and making arrangements for exams. T7 offered an alternative evaluation: "Exams are not correct measurement methods, mostly alternative evaluations are required. However, we have exams out of necessity. I think it would be more useful to do things such as maybe making observations and evaluating without the student noticing." Other views can be cited as an example for the arrangements for exams: "The Ministry needs to make serious regulations in exams. There are huge grievances." (T1); "Highly visual questions should be removed from the curriculum." (T2); "Questions with shapes should not be asked." (T3); "Exam questions must be separate. We should also ask for visuals. Central exams are a problem." (T6).

**DISCUSSION**

This study aimed to determine the teaching experiences of science teachers working in schools for the visually impaired. For this purpose, 12 science teachers were interviewed. As a result of the interviews, the instructional arrangements made by the teachers for the students with visual impairment in science lessons, the issues they had difficulties and their suggestions for the effective and efficient conduct of science lessons were revealed. These were discussed within the scope of the lesson plan, material, content presentation, teaching environment and evaluation categories.

Students with visual impairment in Turkey follow the same program as the students in a science lesson like other curriculum programs (Cakmak et al., 2017). Therefore, it can be said that there is no difference between the education programs applied to the students with visual impairment and their sighted peers by the principles of equality and normalization in education (Sozbilir et al., 2017). However, this situation can ignore the learning needs of students with visual impairment. As a result of the opinions obtained within the scope of this research, it was determined that the lesson plans of science teachers were insufficient and that they prepared their plans or made plans according to the needs. In addition, teachers stated that they could not complete the science curriculum and related this to the limited number of hours and the individual attention paid. Accordingly, it can say that the science curriculum applied to students with visual impairment results in some limitations. In addition, it is thought that this situation may affect the efficiency of science lessons. Science teachers who participated in the study emphasized the need to change the students with visual impairment program and increase the lesson time. Regarding changing the curriculum, the teachers drew attention to not covering every unit in the curriculum, the need to simplify or reorganize the outcomes, and argued that more successful and effective lessons would be conducted in this way. It was stated that using teaching plans designed or adapted for students with visual impairment increases the achievement of these students in science lesson (Wild & Allen, 2009) and facilitates their learning (Fraser & Maguvhe, 2008).

Students with visual impairment cannot learn as efficiently as other students in lessons that require content knowledge, especially in science lessons with intensive visual information (Kandaz, 2004; Karakoc, 2016). Science lessons include a large number of abstract topics, concepts, and communication. This situation may cause students with visual impairment to have difficulties in science classes (Lang, 1983; Zorluoglu & Kizilaslan, 2019). At the same time, science teachers working with students with visual impairment are likely to have difficulties. It was determined that the
teachers who participated in the study had difficulties in some subjects such as light and colour together with the abstract course contents. Therefore, it should not be considered surprising that science teachers working with students with visual impairment have difficulties while teaching abstract topics or concepts. Students with visual impairment may have limitations in learning and cognitive development due to several reasons arising from their lack of vision (Sozbilir et al., 2017). While this situation may restrict the students' observation skills, it can also deprive them of the opportunity to examine visually, mainly because they cannot see what they are dealing with (Fraser & Maguvhe, 2008). In addition, it can limit the use of visual content by science teachers working with students with visual impairment. Findings supporting this statement were found in the research. For example, in this study, it was determined that teachers could not benefit from visual content and could not do all activities in this direction. Coinciding with these findings, in Islek's (2017) study, it has been revealed that teachers have difficulties in lessons or subjects with visual content. Accordingly, it can conclude those science teachers have problems presenting visual content to students with visual impairment. Sozbilir et al. (2017) emphasize that they should make various adaptations in teaching method, environment, and material usage to overcome the difficulties encountered. Considering that there is no separate science program for students with visual impairment in Turkey, some instructional arrangements should be made for these students in science lessons. For example, studies of concretizing knowledge, associating the acquired knowledge with daily life, creating learning environments by doing and experiencing and making sense in mind can be done (Aslan & Savas, 2020). This study determined that science teachers working in the schools for the visually impaired included various instructional arrangements. Some of these arrangements involve utilizing the sense of touch, using other senses other than seeing, using animation/modelling/using living learning activities, and describing the course contents. For students with visual impairment, giving information orally is not enough, but education should be supported with appropriate materials and activities such as trips and observations. Supporting this view, for example, Kumar et al. (2001) suggests using natural objects so that the student can feel by touch, allowing them to explore some subjects in natural environments and provide hands-on learning experiences. Erwin et al. (2001) explain that science teaching to students with visual impairment should be presented with a multi-sensory approach to achieve positive benefits such as tactile and auditory interactions. Zorluoglu (2019) states that activating the senses other than sight is effective in teaching concepts to students with visual impairment and increases success. In this context, it can say that the suggested practices in the literature are similar to the findings obtained from the present research.

Science lessons in Turkey are conducted by teachers who are graduates of the field. Therefore, making the instructional arrangements for students with visual impairment directly influences the teacher's responsibility to operate the lesson (Yalcin, 2020). In this regard, science teachers working at the school for the visually impaired have essential duties. However, science teachers working in these schools receive a general education in universities. Thus they are deprived of the idea of adapting content for students with visual impairment (Fraser & Maguvhe, 2008). Therefore, although they may be hesitant about their science lessons with students with visual impairment, they may prefer to teach the lessons verbally (Yazici, 2017). In the research conducted by Islek (2017), it was determined that the in-field teachers working in schools for the visually impaired were assigned without any special training, they found themselves inadequate in the education of students with visual impairment, and there were significant problems in academic lessons. In this respect, it is stated that teacher education is an effective way to make science education more accessible for students with visual impairment. In addition, teachers should be equipped with science teaching methods for students with visual impairment through special workshops, and teachers should make every effort for practical science lessons (Kumar et al., 2001). Similarly, in this study, suggestions were made by science teachers to train teachers and improve themselves. In addition, recommendations were made by teachers to concretize the content and use different teaching methods. Similarly, findings regarding the concretization of the content for students with visual impairment were reported in Fraser & Maguvhe's (2008) research. In another study, it was stated that different teaching strategies could increase the success of students with visual impairment in learning science (Zorluoglu & Kizilaslan, 2019).
The use of materials in the teaching process is significant for students' success in science lessons (Karamustafaoglu, 2006). This importance increases even more for students with visual impairment because students with visual impairment need much material use or adaptation (Sahin, 2019). However, in this study, most of the science teachers pointed out that their materials were insufficient. In the literature, results supporting this finding were found. For example, Islek (2017) reached a similar conclusion, and it was determined that teachers had difficulties due to a lack of material. Kandaz (2004) also stated that the lack of material was a problem. Another study shows that materials prepared for students with visual impairment are incomplete (Unlu, Pehlivan & Tarhan, 2010). It has been stated by the Toenders, de Putter-Smits, Sanders & den Brok (2017) that there is not enough material available. In this direction, it can be said that the findings of the research in the literature are parallel to the findings obtained from the research. As a result, it can be commented that science teachers working at schools for the visually impaired have difficulties with materials.

In this study, all science teachers stated that they use teacher-made materials to eliminate material deficiencies. However, in this process, it was declared a problem that the preparation of the material took a lot of time and the materials used were not durable. Teachers stated that they included students in the material preparation process and used ready-made materials at times. In addition, it was determined that they preferred tactile materials for students with visual impairment. Studies in the literature show that tactile materials and graphs can help students with visual impairment (Supalo, Humphrey, Mallouk, David Wohlers & Carlsen, 2016; Zebehazy & Wilton, 2014). In this regard, Kumar et al. (2001) state that it is crucial to provide tactile material (e.g. diagrams, graphics) to students with visual impairment and use braille labels. However, students with visual impairment also need visual and auditory materials and tactile materials to participate effectively in educational activities (Yalcin & Kamali Arslantas, 2020). In this context, it can say that it is vital for science teachers to adapt their course materials to enable students with visual impairment to access the curriculum (Zorluoglu et al., 2016). Sozbilir et al. (2017) emphasise that it is essential to provide visually impaired students with easy to perceive and convey information directly. Suggestions were made to give and use appropriate materials for students with visual impairment and have a standard for them. In this respect, it can state that the materials to be used must meet the needs of students with visual impairment. In addition, sufficient material should be provided, especially for science lessons. Rule, Stefanich, Boody & Peiffer (2011) recommend using teaching materials designed and adapted for students with visual impairment. In this way, it can ensure that science lessons are more effective and efficient, and also, students with visual impairment can fully participate in these lessons. Another issue suggested by teachers is that technology should be used. Kumar et al. (2001) recommend that course materials be delivered in braille and flexibly translated into electronic media. They also state that, wherever possible, science teachers should use assistive technologies to improve students' access with visual impairment to science education.

Friend & Bursuck (1999) emphasizes the need for adaptations for students with visual impairment while making an assessment. This study shows that science teachers include instructional arrangements such as reading the questions themselves, preparing a braille exam, having students write the answers, having another student read, or getting help from a teacher who knows braille. However, the teachers also stated that the exams took a long time, and they had problems preparing questions and reading the answers. In addition to these problems, students' performances are not the same, and visual content is a problem. Despite these difficulties, the teachers stated that they made arrangements not to ask visible questions and ask straightforward questions. It is among the suggestions of teachers that arrangements should be made for exams and should use alternative assessments to make evaluations in science lesson more effective and efficient. According to Kumar et al. (2001), science teachers should consider alternative assessment methods for students with visual impairment. In other words, it can say that alternative assessment reforms are needed to ensure equality for students with visual impairment (Stefanich & Egelston-Dodd, 1994). Considering the difficulties teachers encounter in their assessment processes, the use of alternative assessment methods may be advantageous. In other words, adopting alternative methods will be beneficial in terms of supporting the concept development and making a precise evaluation (Sozbilir et al., 2017). In addition, when the effects of disability on learning are clearly felt, alternative assessment methods
should be considered (Kizilaslan, 2020). In this respect, it can state that it is essential to use alternative methods to evaluate students with visual impairment. We can use different evaluation strategies for this. Some of these strategies include giving extra time, preparing braille or enlarged exam paper, getting staff assistance for reading questions and using technology. In addition, arrangements such as using verbal evaluation, product evaluation, peer support, giving additional time in exams, taking exams on their braille tablets or computers using voice-over programs and computer software, preparing exams with large print for students with low vision who can benefit from vision power, magnifying glass with assistive technology tools, or benefitting from screen enlargement programs can also be made.

In this study, the teaching experiences of science teachers working in a school for the visually impaired were examined. Similarly, research can be conducted with teachers who teach Turkish, social studies, mathematics, or other school lessons. In addition, these studies can be carried out with teachers working in inclusive environments, except for the school for the visually impaired. The experiences of teachers in different educational settings can be compared. The results obtained from the current research are limited to the findings obtained from the interviews conducted qualitatively. For this reason, it is recommended to make lesson or classroom observations and the teachers’ opinions. In this way, more holistic data can be obtained.

We want to give some suggestions to science teachers who work with students with visual impairment. For example, while teaching concepts, knowledge or skills in science class, adapting the teaching plans is vital for students with visual impairment to understand the content. Within this framework, you can make adaptations, especially in the materials, presentation of the content, or content itself. In addition, you can create learning by doing environments with various methods such as concretizing information, using the sense of touch, visualizing, using models or materials, associating the acquired knowledge with daily life, and demonstration technique. In addition to these, you can concretize science lessons and reinforce learning with experience-based activities such as trips and observations. Rather than lectures based on verbal expression, using techniques such as experiment, observation, and demonstration frequently, students with visual impairment can develop cause-effect relationships, logic and reasoning, research and questioning skills. Material use is an essential tool in concretizing the outcomes, and activities are critical tools to enable students with visual impairment to be active. It should keep in mind that using materials and activities frequently will allow students with visual impairment to learn effectively. If suitable materials for students with visual impairment cannot be found in this context, existing materials can be adapted, descriptions or technology can be used. In addition, collaborative teaching arrangements can be used to participate in students with visual impairment in classes by benefiting from peer support.

REFERENCES


Designing Technological Content Curriculum Materials Supported by Logger Pro: An Action Research

Ahmet Kumaş
Üşak University

Abstract

This study aimed to develop teacher guide material for students who are uninterested in physics lessons in high schools. In this context, activities in which measurements are made with Logger Pro sensors, which are computer-applied with the innovative technology in 10th-grade optics subjects, have been developed. The study was carried out with 134 students at the school where the researcher taught in the spring semester of the 2019-2020 academic year. In the research, action research method was used. The action researcher personally intervened in the process at every stage of the implementation process to ensure that the teaching material became applicable. Interview, observation and student documents were used to test the hypotheses of the research. The research process was carried out in six stages: Logger pro-supported experimental application, simulation application, analogy application, associating with daily life, modeling and evaluation. Within the scope of action research, qualitative and quantitative methods were used together. Based on research findings; it has been revealed that the developed material is applicable in all types of schools where the 10th-grade physics course is taught, is understandable, overlaps with the content of the curriculum, and has an evaluation competence that can reflect the learning outcomes of the curriculum. As a result of the applications, the students' group success, understanding levels and application skills in the process improved positively in the five observation steps, but the attitudes and motivations of the students with high academic achievement were negatively affected. The reason for this is that it is seen as a waste of time for successful students to devote too much time to students with low academic success and learning together in order to advance group success. It was determined that the motivation and interest of the students reached the highest levels in the stages where the contents of the studies were supported by simulation and video.

Keywords: Education and Technology, Virtual Computing Laboratory, Technological Content Material, Science Education

DOI: 10.29329/ijpe.2022.426.9

Ahmet Kumaş, Dr., Optician, Üşak University, ORCID: 0000-0002-2898-9477
Email: ahmetkumas_61@hotmail.com
INTRODUCTION

Teachers should make effective use of technological developments in order to be able to apply contemporary teaching strategies and to bring their scienticity to the forefront in educational settings. Because the effective use of instructional technologies in the teaching environment helps students to be drawn to the learning center. As a result of this situation, the taught subjects and concepts become interesting and understandable as a part of the students’ lives (İşman, Sevinç, & Altık, 1998; Hırça, Çalk & Akdeniz, 2008). Considering that raising individuals in line with the needs of the society is one of the main objectives of education, it is an important need to benefit from educational technologies by designing educational environments that are equipped to meet technological needs and in the quality required by information societies (Aydın, 2003). It is thought that teaching environments designed with contemporary approaches such as computer-aided laboratory applications can support collaborative learning, active learning and individual learning processes (Sultan, 2010).

In the courses within the scope of science, it is seen that many experimental applications that do not coincide with real-life are used in the process of gaining students the acquisitions in the curriculum (Zhao, Wang, Lv & Liu, 2016; Wang, Liu, Lu, Zhang, Ma, Wang, & Sun, 2018). Within the scope of the data obtained from 342 teachers, 7541 students, and 1500 students’ parents during the physics curriculum prepared in Turkey in 2011; the lack of teacher guide material that will contribute to the teaching systematically (77%), the inadequacy of the application that will contribute to the measurement and evaluation (52%), the need for experimental application (52%), and the students' difficulties in understanding the working systematic of the technological tools around them (55%), emerged as a major problem (MEB, 2011). This situation, while explaining the importance of the national physics curriculum; in order for meaningful learning to take place in the physics course; it is emphasized that it is necessary to design learning environments where the validity of students’ prior knowledge is checked, the contexts they encounter in real life are based, the student is always active mentally, mostly physically, and conceptual change is achieved. In addition, it is pointed out that these learning environments should provide opportunities for students to reinforce the newly learned concept (MEB, 2007; MEB, 2013).

Technology-Assisted Collaborative Learning

Cooperative learning is a process where group members learn together, not competitors, while the learning environment is designed by the teacher. Groups should be designed to consist of 4-6 students in order for effective learning to take place (Bruffee, 1999). In order for the learning process to be completed successfully, all the participants in the group must take active duty and create a learning circle within the division of labor, and all members must reach their learning goals altogether. When a member of the group experiences a lack of learning or performs a wrong learning, this reflects negatively on the evaluation grades of the other group members (Dillenbourg, Järvelä & Fischer, 2009). One for all and all for one is based on interaction. It is essential that interaction is effective in cooperative groups and that this interaction contributes to the course objectives (Bruffee, 1987). The four basic elements of active learning; listening, speaking, writing and communication skills are effectively presented in collaborative groups (Larusson & Alterman, 2009). Technology-assisted learning in collaborative groups is compatible with classic collaborative group learning in terms of the number of members in the group, the quality of the interaction and learning goals. Due to the intriguing effect of technology on high school students, significant problems are experienced in sharing tasks and responsibilities in learning applications with fun technological content (Kitchen & McDougall, 1999). In order to maintain qualified learning systematic in technology-assisted collaborative groups, it is important for teachers to share responsibilities and co-ordinate feedback with group leaders in an effective communication environment (Lee, Tsai, Chai & Koh, 2014). Systematic implementation of technology-assisted teaching practices in collaborative groups significantly limits the distraction and misuse of technological tools in individual practices (Jermann, Soller & Muehlenbrock, 2001). Students who can use technology effectively and efficiently guide students who have less interest and ability in the field of technology in the process, and lead these student groups to use technological applications more effectively in line with instructional goals.
In this context, the importance of both learning in collaborative groups and using technological applications together in order for active learning to take place in a qualified manner becomes prominent.

Turkey Qualifications Framework (TQF), science and competencies in technology applied as a cooperative among students, has become one of the main objectives of submission within the scope of secondary education programs and lifelong technology education in promoting physics education (MEB 2018). In addition, researchers and action practitioners working in the field of physics education emphasized the need to use physics and technology in coordination among student groups in order to contribute to physics education practices (Karacop, 2017). However, despite the emphasis on the necessity of using physics and technology in cooperation effectively in high schools, it comes to the fore that teacher and student guide materials are not developed at a sufficient level in national and international practices (Kan, 2013; Kilmer & Khrehbiel, 2019).

**Logger Pro Supported Applications**

Logger Pro technology is an interactive application for data acquisition and analysis, which makes advanced precise measurements with the help of computers and interfaces. It is very easy to install on the computer and can be performed in as little as a minute. Logger Pro interfaces and sensors are important and high-level components of physics course and laboratory applications. It contains sensor measurement tools that can design experiments within the scope of science in high schools. 100 measurements can be made per second, and they can be presented visually in tables and graphs. The data obtained as a result of the measurements can be presented as word or excel (Vernier, 2021). In Logger Pro training technology, eighty sensors can be attached to an interface separately and measurements can be made. The data obtained as a result of the measurements can be adjusted manually or automatically. A relationship can be established between the graphics presented automatically as a result of the measurements and the graphics that are estimated by hand by the people who make the measurements (Milner-Bolotin & Moll, 2008). With the help of Logger Pro technology, which has started to take an important place in experimental measurements in science education, video recordings of the measured data can be created, and the comparative results of the data in desired time intervals can be evaluated by controlling the speed settings of the video recordings (Setiyani, Kristiyanto & Rondonuwu, 2019). Slopes, tangents and integral values in graphs can be found both by calculating and measuring, and the obtained data can be easily printed (Milner-Bolotin, Kotlicki & Rieger, 2007).

Since the individual use of high-tech equipment has recently become popular, the importance of experimental applications that require high-tech applications where measurements based on sensors that incorporate this technology are required has gradually increased in the field of education (Supalo et al., 2007; Supalo et al., 2014; Linn, Slotta & Baumgartner, 2000; Zhang et al., 2019; Zhao, Tong, Chen & Peng, 2019). For example; According to a study conducted at North Carolina State University, educational institutions whose infrastructures have not developed sufficiently can access powerful computing services with an application for educational activities, which was founded in 2004 under the name of Virtual Computing Laboratory (VCL) and equipped with open source codes in 2008. It has been ensured that applications that cannot be installed separately on the computer can be used over a common infrastructure (Averitt et al., 2007; Virtual Computing Lab [VCL], 2020). Therefore, without incurring extra hardware cost in educational institutions, existing and underdeveloped technological infrastructure and applications requiring performance can be run on a common infrastructure without installing separately on each student's computer. Such applications provide information sharing, functionality and cooperation in electronic environment as well as traditional education (Dong, Zheng, Quiao, Shu, & Yang, 2009; Supalo et al, 2007).

In experiments with VCL applications, a significant reduction in errors in measurement data is achieved and an excellent learning experience is provided for students in physics, biology, science and chemistry (Kilmer & Khrehbiel, 2019). VCL technology allows the course instructor to collect experimental data using electronic probes and displays this data in a spreadsheet or graphical form.
when paired with Logger Pro software. Thanks to VCL, every student has a copy of the Logger Pro software and can analyze data outside of the classroom while working in small groups or alone (Erickson & Cooley, 2007). Traditionally, Logger Pro or similar technologies can be used effectively in laboratories or in small groups that require collaboration that each group of students can access and experiment independently (Milner-Bolotion & Moll, 2008).

Simulation Applications

Studies are carried out to enrich the content of the subjects with computer-assisted activities in order to present abstract subjects within the scope of science effectively in the classroom environment. In this context, one of the applications carried out in classrooms is simulations. Simulations are expressed as models of structures that exist in daily life and cannot be observed (Okuda et. al., 2009). Physics, chemistry and biology courses within the scope of science courses have content that requires physical and mental application. In this context, many methods have been used in researches in order to provide effective teaching. Effective and successful results have been obtained from simulation applications especially in the teaching of abstract subjects (Vogel et. al., 2009). By using simulation applications, science subjects with abstract content are taught in a shorter time, in a more qualified way and student success increases significantly (Hofstein & Lunetta, 2004). Simulation applications can be used effectively in science subjects that cannot be experimented, as well as as a support to better understand the subject in experimental subjects. It is possible to carry out variable measurements, instant feedback content and low cost activities in simulations (Windschitl & Andre, 1998).

Science education in which computer-aided measurements are made; since it is a free application that includes communication and cooperation applications designed for students in all types of schools, it contributes to the school budget since it does not have expenses such as renovating the technological infrastructure, stationery, printing and photocopying costs. Technological tools, in which measurements are made with sensors, have been used effectively within the scope of the research, as they have great potential in terms of educational activities, together with teaching, learning, social sharing, professional development, keeping records and more. Realization of being able to win universities in Turkey through multiple-choice questions, for experimental applications, because of the lack of sufficient physical equipment in schools and the crowded classes, simulations were used in a short time and in order to support experimental applications. Interactive learning in cooperative groups, which is the most effective way of active and collaborative learning, because of the sufficient number of experimental sets and Logger Pro measurement sets for the groups, interactive cooperative learning groups were formed and the process was carried out in order to reach all students in a short time.

The Aim of the Research

Developing alternative and interesting materials for students who have a negative attitude towards abstract subjects and who fail to solve problems in physics course will make significant contributions to the physics teaching process. In this context, the aim of the study is to develop an experimental applied teacher guide material, in which measurements are made with computer-applied Logger Pro-supported sensors, which are supported by innovative technology in secondary education physics 10th grade optic topic, for students who are not interested in the lessons in the process of experimental applications in the classroom in science teaching. Within the scope of the purpose of the research, answers to the following questions were sought:

- Technology supported teacher guide material developed and applied by an action researcher on optics, which is one of the abstract topics in physics course; is it at a sufficient level in terms of applicability, understandability, overlapping with the content of the curriculum and evaluation categories according to the teachers' opinions?
• Are the students’ active interactions with the course content and sharing of responsibilities at a sufficient level during the implementation of the action research based teacher guide material supported by Logger Pro technology supported tools?

• After the application of the action research based teacher guide material supported by Logger Pro technology-supported tools, how does the level of students' associating daily life with contexts develop?

• What is the effect of action research-based teacher guide material, supported by Logger Pro technology-supported tools, on students' academic success?

METHOD

Research Strategy

In this study, liberating / developing / critical action research method which is one of the action research types was used. The action researcher personally intervened in the process at every stage of the implementation process to ensure that the teaching material became applicable. The purposes of this kind of action researches are to discipline the practitioner to gain new knowledge, skills and experiences, as well as to develop a critical perspective towards practices. Action researcher will perceive his in-class systematic studies as a chain of the problem-solving processes and shape the next steps according to this systematic. The main thing in this type of research is to find the right point between theory and practice with the questioning and critical point of view and to present the material suitable for the class level to the service of students and material practitioners (Yıldırım & Şimşek, 2008). In this type of research, the action researcher should also give the application material its final form by performing data collection in classroom observation and application processes by using different techniques (Berg, 2001).

Within the scope of this research type; the theoretical point of view was systematized and planned and implemented as a process in which the researcher was personally involved in the process, developed a critical and questioning perspective at every step of the process, and gave the final form to the teacher guidance material by obtaining the data himself and acting on his analysis.

With the implementation of new physics curriculum in Turkey, instead of teachers teaching lesson subjects with classical methods in classrooms; they are asked to teach courses supported by using local opportunities and innovative technologies (MEB, 2018). In this context, due to the nature of the research, it was thought that action research was appropriate because it is aimed to develop systematic solutions with local resources for the problems faced by a teacher in a classroom where he is working and to create solutions for students to learn better. Hendrics (2006), suggests that parameters such as teaching situations, researcher's characteristics and research questions should be taken into account when deciding which quantitative and qualitative data will be used in action research. Within the scope of the study, both data sets were used in flexible conditions, considering that the researcher has sufficient academic skills in the interpretation and analysis of quantitative and qualitative findings, and that using quantitative and qualitative findings in the content of the teaching will contribute positively to the teaching process.

Participants

In action research, the sample can be expressed as students who are in the teachers' own classes (Palaganas, Sanchez, Molintas & Caricativo, 2017). In this study, the sample group was determined as five classes from the 10th grade at Turkey Trabzon Araklı Mehmet Akif Ersoy Anatolian High School, which is the teacher's own student group. The sample data has been presented in detail in table 1.
Table 1. Detailed representation of the sample group within the scope of the study

<table>
<thead>
<tr>
<th>Gender</th>
<th>Rate (%)</th>
<th>Departments</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (N=62)</td>
<td>46</td>
<td>35</td>
<td>27</td>
</tr>
<tr>
<td>Female (N=72)</td>
<td>54</td>
<td>39</td>
<td>33</td>
</tr>
<tr>
<td>Total (134)</td>
<td>100</td>
<td>74</td>
<td>60</td>
</tr>
</tbody>
</table>

Data Collection Tools

Observation

In the research, structured field work, one of the types of observation, was used. In this type of observation, the researcher, as an external observer, observes the process with the help of a structured measurement tool (Yıldırım & Şimşek, 2008). In the research, the researcher made observations by participating as an external observer in order to evaluate the development and implementation process of the Logger Pro supported guide material. As a data collection tool (M-SCOPS, 2003), it was used as the "Structured Observation Form (SOF)", matching the research content. With the SOF, the positive and negative aspects of the application of the guide material in the classroom were coded on the observation form prepared in advance for the purposes. The observation data obtained from the teachers were classified systematically and associated and combined with the findings obtained from the interview data according to their meaning integrity, grouped according to the content status and evaluated.

Open Ended Questions

Open-ended questions are used in international exams such as PIRLS, TIMSS, PISA and ICILS. Given the failure of Turkey in the international exams, their teaching practices in order to eliminate this deficiency and benefiting from open-ended questions as a measurement tool to detect learning qualifications in activities related to education should be preferred (Cangüven, Oya & Sürmeli, 2017). Although creating and evaluating open-ended questions is difficult and takes a long time, it also enables the measurement of advanced cognitive skills, performance and ability by providing the respondents with the opportunity to express themselves freely and comprehensively (Ozuru, Briner, Kurby & McNamara, 2013). The most important problem of open-ended questions is objectivity in evaluation (Schonlau & Couper, 2016). In the scope of the research; In order to determine the competencies of students in learning activities at a high level, students' knowledge, skills, performance and abilities were measured with the help of open-ended questions at all stages of the application. Collaboration was made with two physics teachers who are experts in their fields while determining and structuring open-ended questions.

Semi-Structured Interview

Semi-structured interviews are the continuation of the process with a flexible interview form by reconfiguring the questions according to the answers given by the participants. In the process of obtaining data, the mimics and behaviors of the participants can also guide the process (Schmidt, 2004). Within the scope of the study, the effectiveness and quality of the technology supported teacher guide material was increased by benefiting from the opinions of physics teachers who taught the subject of optics in their classrooms. Statistical data were obtained by evaluating the opinions of the participating teachers. The difficulties experienced in the applications and the solutions developed were categorized and interpreted. Throughout the process, different questions were asked according to the answers of the participants and the process was tried to be described completely.

Five open-ended questions were prepared for the semi-structured interview. Interview questions were submitted to a total of three expert opinions, one academic and two teachers in the field of science. After the expert opinion was obtained, one question was removed from the items and the interview questions were reduced to four. A pilot study was conducted with a participant in order to
determine the functionality of the interview questions. In the pilot application, it was concluded that there was no problem regarding the functionality of the questions and it was a data collection tool that served the purpose of the research. Semi-structured interview questions are shown below.

What do you think about the applicability of this teaching material in classrooms where you taught optics?

When you apply this teaching material in your classroom, what do you think about the students' understanding of the instructions and practices?

What do you think about the compatibility of the material with the learning outcomes in the curriculum?

What do you think about the contribution of the material to students' problem solving?

**Validity and Reliability**

Interview transcripts were presented to the opinion of two educators who were experts in their fields, and the findings were analyzed together. The codes created by the researcher were gathered under themes that will provide meaning integrity and presented in tables by combining them. Within the scope of the study, various measures have been taken to ensure credibility and transferability. In this context, some parts of the answers given by the participants in the interviews were presented in the findings section in order to provide both validity and reliability as well as the reliability and transferability of the study. Long-term interaction, depth-focused data collection, diversification, expert review, and participant confirmation were made in order to ensure the internal validity of the research, namely its credibility (Onwuegbuzie & Leech, 2007). In addition, the stages followed in the study were reported in detail. However, consistency analysis was used to ensure internal reliability, and confirmation analysis was used to ensure external reliability (Whittetmore, Chase & Mandle, 2001). However, one month after the study was completed, the tables were re-examined and Miles and Huberman (1994) calculated the percentage of compliance. According to Miles and Huberman (2015), the compliance percentage value of a study should be at least 70%. As a result of the investigations carried out within the scope of this study, Miles and Huberman compliance percentage value was found to be 88%. “What do you think about the applicability of this teaching material in classrooms where you taught optics?” 91% for the question, “When you apply this teaching material in your classroom, what do you think about the students' understanding of the instructions and practices?” 85% for the question, “What do you think about the compatibility of the material with the learning outcomes in the curriculum?” 89% for the question and “What do you think about the contribution of the material to students' problem solving?” for the question data, it was found to be 90%. Considering all the processes mentioned above, it can be stated that validity, reliability, credibility and transferability measures are provided at a sufficient level in the analysis of the data.

In the evaluation phase of open-ended questions, the names of the students who were cross, unaware of each other and scored were closed and scoring was performed, and objectivity was achieved by eliminating the effects of halo effect, orientation towards the center, range effect and inconsistency in the evaluation, and scorer bias was tried to be minimized.

**Analysis of Data**

Analysis of semi-structured interview transcripts was done by content analysis. In addition, some of the comprehensive, original and prominent answers were directly presented as an example. Some abbreviations were made while giving the interview findings. These; T1: first teacher, T2: second teacher. In content analysis, the data obtained through interviews and observations are analyzed in four stages: (1) coding the data, (2) finding codes, categories and themes, (3) organizing codes, categories and themes, (4) defining and interpreting the findings (Eysenbach & Köhler, 2002; Miles & Huberman, 1994). These four stages were followed within the scope of the research.
Descriptive analysis and analytical scoring key were used in the observation findings. In this context, in line with Merriam (2002) suggestions, the behaviors to be observed before starting the classroom applications of the Logger Pro supported guide material were determined and a checklist and rubric was developed according to these behaviors. The Findings section was interpreted by establishing cause-effect relationships in line with the researcher's experience. The data in the observation findings obtained from (M-SCOPS, 2003) within the scope of the study were interpreted and presented. The observation stages consist of five steps in total. Each stage; It was evaluated as "1 = very unsatisfactory, 2 = unsatisfactory, 3 = moderate, 4 = sufficient, 5 = advanced". Competence levels are made by taking into account the behaviors in the evaluation processes in table 3.

Before analyzing the open-ended questions, three physics teachers together with the researcher prepared draft answer keys and score scale. The scores that can be given to each stage are noted in detail. Hiding identity and mixed question evaluation methods were used for scoring teachers to be able to evaluate them regardless of the difficulties of the items and the characteristics of the students. As a result of the One-sample t test analysis over 100 points for the upper score of open-ended questions, it was determined whether there was a significant difference according to the passing grade, which is 50 points.

**Development Process of Teacher Guide Material**

There are five 10th grade classes in the school where the researcher teaches. Each of these classes has two hours of physics lessons per week. Students learn physics lessons by coming to the physics laboratory. Since the school is a school that accepts students with success ranking, there are high-level students as academic success. In the last fifteen years, the rate of students who graduated from school and qualified to study at universities has been 92% on average. In the physics laboratory; there are ten long experiment tables, teacher's desk central experiment control panel, smart board, Logger Pro experiment sets, Nova experiment sets, mechanical, optical, electrical and magnetism experiment sets and advanced technology computer aided sensor measurement devices. Physics laboratory is an educational environment that is equipped to provide education to 40 students and is only used by the researcher teacher.

Since the learning environment is the physics laboratory, students are ready for the course in the laboratory by taking the course materials related to the physics course before the lesson starts. There is no specific seating arrangement in the physics laboratory, students can sit wherever they prefer. When students come to class, they usually come as a group of friends, their speaking tone is low, and they have a respectful and affectionate approach to communication. They use body language and communication language that are respectful to physics teachers; often a finger is raised when asking for the right to speak. While the theoretical part of the physics course is covered, students rarely ask questions and ask for a say. The teacher's allowance of partial flexibility while forming the groups caused a short-term chaos in the classroom. After the teacher intervened and gave the groups their final form, the groups started to merge within themselves. Intensive discussions took place among the group members in the selection of the group president and group spokesperson. There were problems in combining different ideas in solving the questions in the guide material distributed to the students. Due to the willingness of each student in the use of Logger Pro supported sensors, there were intense discussions among the group members. Intense support was requested from the teacher in drawing and interpreting the graphics. The effect level of the group scores to be obtained as a result of the activities on the lecture grades was frequently questioned, and the reflection of group scores to all students as individual scores was criticized by the students.

Within the scope of Logger-Pro supported applications, logger-pro sensors and interfaces that can make accurate measurements at the level of 100 measurements per second while making measurements in laboratory experiments and which can be displayed graphically by establishing a relationship between the measurements made, and that can present the obtained data with tables and graphics on the computer screen have been used effectively. The sensors and interfaces used within the scope of the research are accepted as the most advanced version of the sensors and interfaces used
in technological equipment in daily life in the laboratory environment. A section of the light sensor and interface used within the scope of the research is shown in figure 2.

Figure 1. Logger-pro interface and light sensor used in measurements

Basic optical concepts within the scope of the research; 2018 in Turkey physics curriculum content and descriptions are shown in table 2.

Table 2. Logger-pro interface and light sensor used in measurements

<table>
<thead>
<tr>
<th>Teaching application</th>
<th>Detailed information on the purpose and application process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Establishing a relationship between the concepts of luminous intensity, luminous flux and enlightenment.</td>
</tr>
<tr>
<td></td>
<td>- By doing experiments or simulations, a relationship is established between the concepts of enlightenment intensity, light intensity, luminous flux.</td>
</tr>
<tr>
<td>Sub goals</td>
<td>- Mathematical models related to the concepts of luminous intensity, luminous flux and enlightenment are utilized.</td>
</tr>
<tr>
<td>Explanation</td>
<td>Mathematical calculations are not made.</td>
</tr>
<tr>
<td>Conceptual teaching</td>
<td>Luminous intensity: It is an indicator of the amount of light emitted from the source per unit time.</td>
</tr>
<tr>
<td>objectives</td>
<td>Enlightenment intensity: The unit is the indicator of the light intensity on the surface.</td>
</tr>
<tr>
<td></td>
<td>Luminous flux: The light energy that a light source drops on a certain surface per unit time.</td>
</tr>
</tbody>
</table>

While preparing the teacher guide material, the information in table 1 was taken into consideration. Within the scope of this research, Mills (2003) action research was applied by shaping the cyclical structure of the environment according to the physical and academic readiness of the students. This process has been implemented as in figure 1.

Figure 2. Action research application steps applied within the scope of the research
The research carried out in Turkey; in the 2019-2020 academic years, it was applied to 134 students in the 10th grade for sixteen class hours. In the process of teaching the basic concepts of optics, the activities to be applied in the teaching material were decided based on three different teaching systematic developed by Rogers (1995), Gladhart (2001) and Russell (1996). These stages and the developed teaching material are shown in table 3.

Table 3. The development process of teacher guidance material

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Awareness of innovation</td>
<td>Preliminary information</td>
<td>Preliminary information</td>
<td>Analogy application</td>
</tr>
<tr>
<td>2</td>
<td>Attitude to new knowledge</td>
<td>Teaching the process</td>
<td>Adoption</td>
<td>Experimental application with Logger Pro support</td>
</tr>
<tr>
<td>3</td>
<td>Prediction of new knowledge</td>
<td>Making sense of the process</td>
<td>Adaptation</td>
<td>Simulation applications</td>
</tr>
<tr>
<td>4</td>
<td>Application of new knowledge</td>
<td>Remembering the concept and a sense of competence</td>
<td>Identification with yourself</td>
<td>Relating activity with daily life</td>
</tr>
<tr>
<td>5</td>
<td>Evaluation of applications</td>
<td>Application in new situations</td>
<td>Ability to apply in a new situation</td>
<td>Modeling applications</td>
</tr>
<tr>
<td>6</td>
<td>Context-based innovative applications</td>
<td></td>
<td></td>
<td>Evaluation questions</td>
</tr>
</tbody>
</table>

In Table 3, alternative representations of the stages that can be applied in new teaching systematics in the literature are presented. Within the scope of this research; Using these three teaching systematics, activities were developed with the direction of the action researcher and a new teaching material that could be applied in the classroom was introduced.

While developing an experimental applied teacher guidance material for the 10th grade in high school physics, which is supported by innovative technology in optics, and where measurements are made with the computer-applied Logger Pro supported sensors; The teaching systematics developed based on three different teaching systematics developed by Rogers (1995), Gladhart (2001) and Russell (1996) is shown in table 4 in four stages.

Table 4. Experimental application stages where measurements are made with Logger Pro supported sensors

<table>
<thead>
<tr>
<th>Application stages</th>
<th>Evaluation process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logger Pro</td>
<td>By setting up a Logger pro supported setup, making measurements and drawing graphics by processing them on the table. Interpretation of the values and graphics</td>
</tr>
<tr>
<td>Simulation</td>
<td>Interpreting the studies obtained with experimental applications supported by simulation activities</td>
</tr>
<tr>
<td>Analogy</td>
<td>Determining the situation of demonstrating the concrete resemblance of the information learned with the help of analogy map</td>
</tr>
<tr>
<td>Associating with Everyday Life</td>
<td>Interpretation of the results obtained with three application steps</td>
</tr>
<tr>
<td>Modeling</td>
<td>Questioning applications by developing mathematical and mental models</td>
</tr>
<tr>
<td>Evaluation</td>
<td>To reveal the level of association of daily life problems with the gains in the activity processes in the application stages</td>
</tr>
</tbody>
</table>

As seen in table 4, it is aimed to carry out activities that are at the center of the learning process of students and that can contribute to the learning competencies of all students.
**FINDINGS**

Observation Findings

The process was observed by the action researcher in order to determine whether the teacher guidance material developed as a result of the six-stage applications meets the teaching competencies and the observation findings in a classroom are shown in Table 5.

Table 5. Observation findings obtained during the six-stage action research-based laboratory implementation process.

<table>
<thead>
<tr>
<th>Observed Behaviors</th>
<th>Groups and Ratings</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration and interaction in the experimental implementation phase with Logger Pro support</td>
<td>4 4 5 4 4 5</td>
<td>4.3</td>
</tr>
<tr>
<td>Cooperation and interaction during the simulation implementation phase</td>
<td>5 5 4 5 4 4</td>
<td>4.7</td>
</tr>
<tr>
<td>Cooperation and interaction at the technology-supported analogy implementation phase</td>
<td>4 3 3 4 3 4</td>
<td>3.5</td>
</tr>
<tr>
<td>Cooperation and interaction at the stage of relating to everyday life</td>
<td>3 3 3 4 3 3</td>
<td>3.2</td>
</tr>
<tr>
<td>Collaboration and interaction in the modeling phase</td>
<td>3 4 3 4 3 4</td>
<td>3.5</td>
</tr>
<tr>
<td>Collaboration and interaction in the evaluation phase</td>
<td>4 4 5 3 4 4</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Student behaviors during the lesson process

Since it was reminded that group and individual evaluations will be taken into consideration from the first week, the division of labor within the group was carefully done there is intense pressure on the desire to use mobile phones.
There are difficulties in interpreting analogy.
There are discussions in the group about the quality of the appropriate video. Everyone was actively forced to take responsibility in groups.
There are serious problems and discussions about model building.
During the simulation phase, students have fun.

As can be seen in Table 8, during the six-stage action research-based laboratory applications process, the cooperation and interaction competencies of the students in experimental applications and simulation applications supported by Logger Pro are very good, and in the process of cooperation and interaction at the stage of associating with daily life, partial inadequacies have been observed.

In the first stage; all groups showed an advanced level of performance in the stages of setting up Logger pro supported setup, making measurements, drawing graphics by processing on the table, and interpreting the values and graphics. Because the interaction of the 3rd group and the 6th group members was shared among all group members homogeneously, they got full points. Other group members could not share their duties and responsibilities homogeneously. It was observed that some group members were very active while others remained passive.

The second stage, "Cooperation and interaction in the simulation application stage", was carried out in the computer-technology laboratory classroom of the school for one class hour for each branch. It was observed that all student groups took active responsibilities throughout the applications and carried out their duties sincerely and questioning. It was observed that one student each in the third and sixth groups tried to open other programs on the computer during the simulation applications and negatively affected the motivation of the other group members.

The third stage, "Cooperation and interaction in the analogy application stage" was a stage that students encountered for the first time and had difficulties in understanding and interpreting. Groups of students, who had to fill in the analogy map within a period of 20 minutes, sometimes moved away from the context and applied to different practices. Although the members of the 2nd, 3rd and 5th
groups, who got 3 points, were very interested in the beginning of the activity, after the seventh minute, they started to be interested in the next parts of the worksheet, and some group members were observed to have discussions and communication with other group members on different topics. Although the 1st, 4th and 6th group members, who got 4 points each, followed the process very well, they chose to produce individual solutions instead of interaction within the group.

The fourth stage, "Cooperation and interaction in the stage of relating with everyday life" is the stage in which the student groups have the lowest average score. This stage includes the URL addresses of the students previously determined by the teacher; it is the stage that they should follow and interpret by taking into account the concepts of light intensity, illumination intensity and luminous flux. 4th group members carefully followed the light events in both video images and took notes under three subheadings. It was observed that the students in the other five groups made comments about the off-topic visuals while watching the video recordings and moved away from the context.

In the fifth stage, "Cooperation and interaction in the modeling stage", it was aimed to question the applications in the previous stages by developing mathematical and mental models of the student groups. Group 1 and group 3 members acted individually and filled in the blanks on the worksheet. Fifth group members disrupted the integrity among themselves by interacting with other group members. Although the students in the second, fourth, and sixth groups acted effectively in sharing responsibilities, they could not fully ensure the internal integrity of the group throughout the entire time. Sixth group members had active discussions to solve the meaning pattern of the concepts of luminous intensity, illumination intensity and luminous flux during the 20-minute activity period. The sixth question of this stage, the figure drawing stage, revealed that the relationship in expressing mental modeling as physical modeling was not sufficiently developed.

It was aimed to reveal the level of association of daily life problems with the acquisitions in the activity processes in the application stages from student groups in the stage of "cooperation and interaction in the evaluation stage". It was observed from the group discussions that the awareness states in the applications of the examples of increase or decrease of light intensity, enlightenment intensity and luminous flux in daily life were expressed by all groups except the fifth group. Fifth group members humorously compared the concept of enlightenment violence with the enlightenment subjects in other lessons and moved away from the context in their discussions. Third group members were found to be effective in both task sharing and taking responsibility, researching and concluding. In other groups, it was observed that the tasks were fulfilled by taking effective responsibility, although sometimes they went out of the subject.

Open-Ended Questions Findings

The scores obtained by the student groups as a result of the evaluations made by considering all the stages in the worksheets are shown in Table 6.

Table 6. The scores of student groups from open-ended questions in technology-supported applications

<table>
<thead>
<tr>
<th>Activity Evaluation Process</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
<th>Group 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logger Pro Supported Experimental Application (24 points)</td>
<td>15</td>
<td>21</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Simulation Practice (12 points)</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>9</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Analogy Practice (12 points)</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Everyday Life Practice (12 points)</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Model Development (24 points)</td>
<td>16</td>
<td>16</td>
<td>12</td>
<td>20</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>Evaluation Process (16 points)</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Total Points (100 points)</td>
<td>69</td>
<td>75</td>
<td>72</td>
<td>84</td>
<td>89</td>
<td>79</td>
</tr>
</tbody>
</table>

As can be seen in Table 6, the student groups are quite successful in the experimental process, simulation process and evaluation processes in the six-step action research-based laboratory
application process; it is seen that they show moderate success in analogy, model development and video finding and interpretation processes.

In the experimental application phase supported by Logger Pro, the students were evaluated with eight questions. In the experimental application phase supported by Logger Pro, the students were evaluated with eight questions. Each correct answer was evaluated on a total of "24 points", with "3 points". All groups gave correct answers to the questions "relationship between light intensity and potential difference change", "evaluation of light intensity", "value of light intensity measured with distance from the light source" and "evaluation of light intensity". Group 2 and group 5 students simply plotted the potential difference-light intensity graph incorrectly. The 4th group and the 6th group members made the display and graphic drawing incorrectly with the model in the first measurement, and the 1st group and 3rd group members made the representation and graphic drawing with the model in the first and second measurements incomplete. It has been observed that a "direct proportional graph" was drawn as a general mistake in the graphical drawings. Failure to make the appropriate association in drawing the model draws attention as the most important error in the representation with the model.

When the group responses were examined, it was determined that only the 4th group gave the wrong answer "The intensity of illumination on the object will not change as a result of increasing the intensity of the light source". Other groups gave correct answers to all questions.

At the analogy stage, each correct answer was "3 points", and the groups were evaluated with four questions, with a total of "12 points". The first question, "the comparison of the number of arrows shot", was written incorrectly as the "intensity of enlightenment" by the first, second and sixth groups. The question of "the number of arrows fired at the target in one minute" was answered incorrectly by all groups except the fifth group. Other questions were answered correctly by all groups.

In the "daily life practice" phase, the groups included six questions in total; each correct answer was scored with "2 points" and a total of "12 points". The first and sixth groups incorrectly answered the change in light intensity in the sunset video as "decreasing". The first and second groups incorrectly answered the change in light flux in the sunset video as "unchanging". All other questions were answered correctly by all groups.

In the "model development" application, the groups were evaluated with six questions. Each correct answer was evaluated with "4 points", with a total of "24 points". While defining the luminous flux in the first, second and sixth groups, it was seen that they confused it with the intensity of illumination by expressing "the amount of light emitted from the light source as the amount of illumination of a surface". All group members made "the representation of the relationship between illumination, light intensity, and luminous flux by drawing" incomplete or incorrect. The third, fourth and sixth groups used the concepts of luminous flux and enlightenment intensity interchangeably; the first, second and fifth groups mixed the concepts of light intensity and luminous flux with each other and made a drawing by mixing them.

During the evaluation process, the groups were evaluated with four questions. Each correct answer was evaluated with "4 points", with a total of "16 points". Four groups expressed the concepts of luminous intensity, enlightenment and luminous flux as incomplete or incorrect by mixing them with each other while explaining the concepts.

<table>
<thead>
<tr>
<th>N</th>
<th>X</th>
<th>S</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>134</td>
<td>72.22</td>
<td>13.28</td>
<td>133</td>
<td>19.37</td>
<td>.000</td>
</tr>
</tbody>
</table>
As seen in table 7, the level of learning optical concepts as a result of action research-based applications during the implementation of the six-stage Logger Pro supported teacher guidance material was evaluated with a grade. As a result of these evaluations, it shows that there is a significant difference according to the 50 points expected from students as success. \( t(133) = 19.37, p <.01 \), it was determined that the average score of the students as a result of the activities was approximately 72 scores.

**Interview Findings**

The teacher guidance material was evaluated by fifteen teachers who are experts in their fields before the application. The evaluations of teachers working in different school types are shown in table 8.

**Table 8. Evaluation of the instructional material according to the teachers' opinions**

<table>
<thead>
<tr>
<th>Teacher Opinion</th>
<th>Participants</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>It can be applied in different school and classroom settings.</td>
<td>+ + + + + - + + + + + - + - -</td>
<td>80</td>
</tr>
<tr>
<td>It is understandable regardless of their readiness to learn.</td>
<td>+ + + - + + - + + + + + + + +</td>
<td>80</td>
</tr>
<tr>
<td>There are enough activities that coincide with the learning goals.</td>
<td>+ + + + + + + + + + + + +</td>
<td>100</td>
</tr>
<tr>
<td>It contributes sufficiently to the problem solving process.</td>
<td>+ + - + + - + + + + + +</td>
<td>73</td>
</tr>
</tbody>
</table>

As can be seen in Table 8, the answers given by the teachers to the interview questions regarding the application process of the developed teaching material in the classroom environment have been categorized and shown. The applicability of the teaching material in different school and classroom environments, the students’ ability to perceive the activities and application stages according to different readiness levels, the competencies of the activities to coincide with the acquisitions and the contribution of the material to students’ problem solving were shown.

The interview questions asked to teachers within the scope of the evaluation of the teaching material and some answers overlapping with the evaluation category are shown below.

**Question 1:** What do you think about the applicability of this teaching material in classes where you teach physics? As an example of the answers given in the positivity category: T2: “I think that the students at the school where I work will be very productive, especially in the experimental and analogical application stages, as they deal with skill-based applications. This will contribute to students’ being more eager in evaluation questions”. T8: “I think it is neither too challenging nor too simple since I work at a middle level Anatolian high school. The physical and technological competence of the school also meets the requirements of the material”. T14: “Absolutely yes. I think it will be very successful and effective”. As an example of the answers given in the negativity category: T13: “I think that students in science high school type schools will benefit partially because they concentrate more on problem solving”. T15: “I work in a school where students with exam anxiety are concentrated. I am concerned that it can be applied effectively”.

**Question 2:** When you apply this teaching material in your classroom, what do you think about the students' understanding of the instructions and practices? As an example of the answers given in the category of positivity: T10: “I think it is neither too challenging nor too simple since I am in a middle level Anatolian high school. The physical and technological competence of the school also meets the requirements of the material”. T15: “There are students at different academic levels in the classes I teach. In the teaching material, there are clear instructions and questions that students at all levels can understand”. T11: “The directives and other practices in the material are quite clear. It can be easily understood by students”. T3: “The instructions are quite clear and understandable. I think the instructions and questions are more understandable especially for intermediate students”. As an
example of the answers given in the negativity category: T5: “I think the students are unwilling to the academic courses, they will harm the equipment and sensors”.

Question 3: What do you think about the compatibility of the material with the goals of the curriculum? All of the teachers stated that the material developed overlaps with the curriculum objectives. Some of the teacher's views are as follows: T3: “There are applications that will fully teach the concepts of luminous intensity and enlightenment, more concrete examples related to the concept of luminous flux could be emphasized”. T7: “Establishing the relationship between the first sub-goals, the intensity of illumination, luminous intensity and luminous flux through experiment and simulation applications, was handled quite appropriately. Achievement goals are fully felt in the activities”. T11: “The second sub-target was applied without being felt by the teaching activities. Activities that can be taught to students through activities in a clear and understandable way are available in the teacher's guide material”. T14: “The teaching material is fully compatible with the goals”. T15: “Application of analogy; He explained the abstract concepts of luminous intensity, luminous flux and enlightenment very well”.

Question 4: To what extent do you think the material will contribute to students’ problem solving? As an example of the answers given in the category of positivity: T5: “I think that it will contribute a lot to the solution of real life problems especially”. T7: "I think that after the material is fully applied, students will be able to easily solve the questions in the central exams in recent years". T12: "It will partially contribute to the problem solving of students in science high schools, and will contribute a lot to the problem solving of students in other types of schools". As an example of the answers given in the negativity category: T6: “I think they can solve all verbal questions. I don't think it will make much contribution to numerical and operative questions”.

**DISCUSSION, CONCLUSION, AND RECOMMENDATIONS**

The research provides an example of how to create applications that test higher-order thinking skills such as data analysis and evaluation by applying the concepts learned in the classroom to real-life situations in modern technology science teaching.

In physics subjects where innovative technology-supported measurements are made, students' interactions with each other, their efforts to reach results by making research and questioning are quite advanced. In physics experiments and applications in which measurements are made with technology-supported sensors, when the sharing of duties and responsibilities between group members is done effectively, the group interaction and success of the students are much more advanced. Since Logger Pro supported measurements are entertaining for students, all students in the group are volunteers to take measurements and fulfill their responsibilities regarding measurements. It is stated in the literature that technology-supported science teaching has a positive effect on students' attitudes and achievements, as well as contributing to attitude, behavior and interaction processes (Yeh, Tsai, Tsai & Chang, 2019).

After performing experimental measurements with sensors in the physics laboratory, performing simulation applications in the computer and technology laboratory was perceived as a new and exciting environment for students, and developed positive pre-attitudes in learning new physics concepts. The technology-aided implementation of the first three stages ensured the active participation of all group members and made a significant contribution to learning the subject. As a result of the meta-analysis conducted among 42 studies by (Wang et. al., 2014); In most of the studies, it is in line with the findings that experimental applications in the applications within the scope of science courses are supported with advanced technology tools and computer-aided enriched content, making a significant positive contribution to students' attitudes. It has been stated by that student groups who cannot actively participate in a poorly planned process will isolate themselves from the groups and lesson subjects as a result of technology-supported activities and their learning processes will be damaged (Keller & Cernerud, 2002). This finding coincides with the importance of the active participation prerequisite for each group member in the study.
Technology-aided analogy practices created significant support for students to participate in the lesson more effectively. The fact that the first two stages of the teacher's guideline material is technology supported has formed integrity with the fact that the third stage is technology supported. The first encounter of the student groups with the application of analogy created a problem at the beginning of the process. In the following processes, the development of analogy map by integrating the computer game with the analogies enabled the students to be more active towards the lesson. Teaching abstract physics subjects with technology supported analogy applications has made a positive contribution to the students' attitudes towards physics subjects. The effectiveness of computer-aided analogy applications towards the academic achievement of 7th grade students in science classes, their attitudes towards the course and the permanence of knowledge is in accordance with the researches determined by (Celik, Kirindi & Kotaman, 2020).

The most important problem encountered in the teaching of physics subjects is that the subjects learned in the classroom cannot be associated with daily life situations. Although we use technology at the highest level in the tools and equipment we use in daily life, the experiments in the physics laboratory are carried out with classical experimental materials. As a result of the effective application of technology supported teacher guidance material in the classroom environment, it makes a significant contribution to the relationship between students' experimental practices and daily life practices. As a result of the studies in which technology-supported science teaching was analyzed taking into account teachers' views (Namdar & Salih, 2017; Babacan & Ören, 2017) and student views (Haron, Othman & Awang, 2019; Yıldırım & Sensoy, 2018), it was significantly shows a supportive feature with the findings it contributes.

Teaching abstract physics topics through mental and physical models has an important place in active learning. Teaching abstract physics topics by making measurements with Logger Pro supported sensors, using technology-supported simulations and informatics-supported analogies contributes positively to students' effective participation in the processes of physical and mental modeling, to adopt the process by discussing, and to model development attitudes in interaction with other group peers. The reason for this is that the daily life applications of students in this age group are generally equipped with technological tools such as smart phones, tablets and computers, and that such applications come to the fore as an important motivation tool when used as a learning tool in the classroom. (Ring, Dare, Crotty & Roehrig, 2017; Windschitl, Thompson & Braaten, 2020) emphasized in their study that in addition to the development of science, technology and mathematics skills of students in science teaching based on innovative technology, modeling competencies will also be advanced. (Retnawati, Arlinwibowo, Wulandari & Pradani, 2018) emphasizes that physics teachers have serious difficulties in presenting mathematical models to students, and that technology and other active learning strategies should be used in a way that coincides with student interests and attitudes in order to overcome these problems.

It is known that the concepts of luminous intensity, illumination intensity and luminous flux are abstract and complex concepts that are intertwined for high school students and that there are important problems in the solutions of daily life problems related to these concepts. Developing solutions by organizing and discussing technology-supported activities with other peers who have similar problems in order to assimilate and solve abstract optics by students make a significant contribution to the solution of these problems. (Ramma, Bholoa, Watts & Nadal, 2018; Sunal et. al., 2019) in their research, it is stated that the application of technological applications that attract the attention of students to the groups within the scope of the physics course, contributes positively to the development of students' responsibilities and to the development of their skills through active knowledge sharing.

One of the most important problems in active teaching practices is the evaluation of the result with different question models after the applications are completed, not the learning process. In this context, the evaluation of desired behaviors in the process is ignored. As a result, students focus on being successful as a result, not in the learning process. Neglecting the process also makes the result unsuccessful. In this context, in all processes of this study, observation, open-ended questions and
interview findings were used to evaluate at the end of each stage, and as a result of the description of the whole process together with the result, the students were enabled to take active responsibility in all stages of learning practices. Considering that ensuring group integrity creates group success and consequently contributes to the scores of all members in the group, all group members take active responsibility at every stage of technology-supported learning practices, and students actively participate in the content of the subject. (van Leeuwen & Janssen, 2019) reveals that the learning process will be successfully completed in all individuals of the groups as long as teachers in secondary and high schools can effectively follow the process and encourage groups to cooperate under auto-control systematically.

One of the important problems encountered in technology supported action research applications is the use of technological tools outside of the course contents during the course applications. Considering that the group scores will be shared among all group members within the scope of the study, effective group work and the evaluation of the process by describing it with observations make a positive contribution to the success and responsibilities of the students. In particular, game-based analogy applications cause students to go out of context to a significant extent. The evaluation of the process with open-ended questions at all application stages contributes to the prevention of out-of-context applications. Despite the fact that one of the drawbacks of using game-based technology in teaching practices in the literature is out-of-context activities (Mayer, 2019; Papadakis, 2018; Zhonggen, 2019), solutions for out-of-context activities have not been presented.

The presence of evaluation activities at all stages of the applications where abstract content physics subjects are supported with technological measurements and applications and taught with technology tools contributes to the students to remain active at every stage of the lesson. The guide material, which provides active participation at every stage of the teaching practices, provides a significant academic success increase as a result of the process. Although it is stated that evaluating students with their positive behaviors at every stage of the course will contribute positively to the learning process and students' learning attitudes (Moss, & Brookhart, 2012; Made et. Al., 2019); there are no practical examples in the literature regarding what kind of activities to achieve this situation.

In Virtual Logger Pro technology-supported application systematic, presenting measurements with desired precision, graphic support and different variables together contributes to the formation of an effective and holistic teaching systematic and to enable students to construct graphical applications at analysis-synthesis level in the later stages of the process. (Oktaviyanti & Pramudya, 2019), in their studies where they evaluate the angular velocity and angular acceleration by placing the logger pro magnetic sensor on the upper part of the propeller, they confirm that the use of such advanced technology tools contributes to the learning activities at the analysis synthesis level. In addition, as a result of measurements with Logger Pro supported sensors, it is very easy to construct, interpret and associate mathematical models in optics with daily life based on graphic representations. As a result, holistic learning in physics course subjects takes place at a significant level. It also increases the quality of the teaching process in heterogeneous school types where students 'academic readiness levels differ, and contributes to students' comparative knowledge about variables in abstract concepts.

In the study, an experimental applied teacher guide material, which is based on innovative technology-supported computer-applied Logger Pro-supported sensors, was developed and examined for students who are not interested in abstract physics in science teaching. The focus was on the active use of computer and technology content by students at all stages of the study. In Turkey, the first time through analogies in science teaching has benefited from computer-aided applications. The fact that measurement tools are extraordinary in technology supported applications and that they perform highly sensitive measurements contribute significantly to the teaching of abstract physics subjects that are desired to be taught. Teaching course contents by using technological equipment and computer technology together has an important effect on the development of professional attitudes in students. In future research, it is important to consider three important situations. First, presenting the problems of daily life in abstract physics to the students before the lesson, and listing the solution suggestions of the students. Second, planning activities by integrating physics-technology-computer interaction with
abstract physics topics. Third, collaborative learning groups, where each student can be at the center of the learning process, are professionally designed in the classroom environment and there are assessment activities in all learning stages.

We hope that this study will provide researchers interested in science education in developing countries with an important perspective on the use of technology and science together. In addition, we believe that it will contribute as an important resource material to teachers who try to maximize students' interests, attitudes and motivations while teaching physics subjects.

REFERENCES


Game of Archery (2020). Rekor oyun archery game. Turkey.


VCL (2013). Virtual Computing lab. 16.06.2019


URL-1: Sunset on Mount Nemrut. (date of access: 17.10.2019)

URL-2: Sunrise on Mount Nemrut, (date of access: 17.10.2019)
Appendix A. Technology supported teacher guide material with Logger Pro content

1. Experimental application with Logger Pro support

- Set up the simple electrical circuit experiment setup shown in the figure.
- Install the Logger Pro interface and light sensor together with the computer hardware.
- Increase the volt value in the power supply regularly as indicated in the table and write the measured values in the table.
- Show the modeling for light intensity by drawing your figures on the table.
- Write your verbal evaluations about light intensity on the table.

<table>
<thead>
<tr>
<th>Power supply voltage (Volt)</th>
<th>Light intensity value measured at the light sensor (5 cm distance)</th>
<th>Demonstrate with model</th>
<th>Evaluation of light intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Show your estimated drawings that can be obtained with the Logger Pro program and sensors on the figure, after measuring, compare the measurement results with your drawing results.

- Show the relationship between volt-light intensity on the graph, taking into account the data you measure.
• Without changing the voltage value of the power source, move the light sensor away from the light source and show the light intensity values measured on the curtain in the table.

<table>
<thead>
<tr>
<th>Distance from light source (cm)</th>
<th>Light intensity value measured at the light sensor (4.5 Volt)</th>
<th>Demonstrate with model</th>
<th>Evaluation of light intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Show the relationship between distance-light intensity on the graph, taking into account the data you measure.

![Graph showing distance vs. light intensity]

• Show your estimated drawings that can be obtained with the Logger Pro program and sensors on the figure, after measuring, compare the measurement results with your drawing results (4.5 volt).

![Estimated drawings and measured results]
2. Simulations

Run the virtual-light-lab application.

- Using the simulation application program, answer the questions below with applications.
  a. When you bring the light source closer to the object, the amount of enlightenment on the curtain
     ........................................................................
  b. The intensity of illumination on the curtain when you move the light source away from the object ........... ................. ...............
  c. When you increase the intensity of the light source, the intensity of illumination on the curtain
     ........................................................................
  d. When you reduce the intensity of the light source, the light intensity on the curtain ......
     ........................................................................

3. Analogy With the Computer Game

(Archery game) Enter this web page.

- In the archery game application, make five shots to the target. All group members shoot five arrows to
  the target and write down your results on the worksheet. Keep time during the shooting of all members
  of the group, determine the number of arrows hit on the target and create a success ranking according to the
  time.
- Using the analogy application, fill in the blank spaces in the analogy map appropriately.

<table>
<thead>
<tr>
<th>Similarity</th>
<th>Comparison</th>
<th>Simulated feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of arrows shot</td>
<td>Comparable</td>
<td>Light intensity</td>
</tr>
<tr>
<td>Number of arrows hitting the target</td>
<td>Comparable</td>
<td>Illumination intensity</td>
</tr>
<tr>
<td>Number of arrows reaching the target in one minute</td>
<td>Comparable</td>
<td>Luminous flux</td>
</tr>
<tr>
<td>Arrows</td>
<td>Incomparable</td>
<td>Light</td>
</tr>
</tbody>
</table>

4. Daily Life Practice

The video about sunrise and sunset in the link below; Watch by considering the concepts of light intensity, illumination and luminous flux.

(URL-1) Sunset video: Watch and discuss with your group friends, taking into account the concepts of luminous intensity, illumination and luminous flux.

(URL-2) Watch the sunrise video taking into account the concepts of light intensity, illumination intensity and luminous flux and discuss with your group friends.

Fill in the blanks below according to the changes in the videos you watch.

<table>
<thead>
<tr>
<th>Optics concept</th>
<th>Change in the sunset</th>
<th>Change in Sunrise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light intensity</td>
<td>Constant</td>
<td>Constant</td>
</tr>
<tr>
<td>Illumination</td>
<td>Decreases</td>
<td>Increases</td>
</tr>
<tr>
<td>Luminous flux</td>
<td>Decreases</td>
<td>Increases</td>
</tr>
</tbody>
</table>
5. Model development application

- How can you express the light intensity? 

- How can you define the concept of illumination?

- How can the luminous flux best be defined?

- By which optical concept can the better observation of things in an environment be expressed?

- Write down the variables that affect illumination.

- Show the relationship between illumination, luminous intensity and luminous flux by drawing a figure.

6. Evaluation process

- Explain the pictures in case (a) and (b), taking into account the concepts of light intensity, illumination and luminous flux.

- How can it be achieved to increase the light intensity in the pictures above?

- How to increase the illumination in the pictures above?

- How to increase the luminous flux in the pictures above?
The Effects of Children’s Rights and Democracy Education on Children’s Democratic Behaviors

Sevi Kent Kükürtcü i
Ministry of National Education

Nefise Semra Erkan ii
İstanbul Gelişim University

Abstract

This study aims to investigate the effects of early childhood Children’s Rights and Democracy Education on children’s democratic behaviors. The study group consisted of a total of 53 children (28 experimental, 25 control) aged between 60-72 months, who were attending two kindergartens affiliated with the Directorate of National Education in Kayseri. The study used the quantitative research method of pretest/posttest and control group quasi-experimental design. Data were collected by using the Democratic Behavior Scale developed by the researcher.

The findings showed that while no significant difference existed between the pretest scores of the experimental and control groups prior to Children’s Rights and Democracy Education, the posttest mean scores of the experimental group increased significantly after the training as compared to the control group. In addition, learning was shown to be permanent by the results of a retention test given to the experimental group one month after the program ended. The results showed that the children who participated in the Children’s Rights and Democracy Education program displayed higher and more permanent development than the control children in the democratic behavior, autonomous behavior, and knowing one’s rights subdimensions of the Democratic Behavior Scale.

Keywords: Early Childhood Education, Preschool, Human Rights Education, Children’s Rights Education, Democracy Education, Democratic Behaviors

DOI: 10.29329/ijpe.2022.426.10

_______________________________________________________________________

i Sevi Kent Kükürtcü, Ministry of National Education, ORCID: 0000-0001-7738-4274
Correspondence: sevikent@gmail.com

ii Nefise Semra Erkan, Prof. Dr., School of Health Sciences, İstanbul Gelişim University
INTRODUCTION

As today's children will become tomorrow’s leaders, we should teach them from early childhood with an educational approach similar to the one used in Children’s Rights and Democracy Education, which focuses on their rights and equips them with responsible citizenship skills, as well as a culture of democracy (Akyüz, 2001; Atay, 2009).

Children’s Rights and Democracy Education (CRDE) is based on the Convention on the Rights of the Child (CRC), which grants children individual rights and aims to transform them into respectful, open-minded, creative and sensitive individuals who respect human rights (Akyüz, 2001; Ay Zög, 2008). In order for children to become such individuals, they first need to know their own rights (Lundy, 2007; Özdemir Uluç, 2008). Item 42 of the CRC calls for the teaching of children’s rights to children as well as adults. It is seen as a basic right for children to know their legal rights (Neslitürk and Ersoy, 2007; Washington, 2010; Uçuş, 2014; Seyhan and Cansever, 2015:346).

Early childhood is a determining period when children’s physical, mental and social development is at its fastest. It is during this period that social skills such as cooperation, sharing, participation in group activities, expressing opinions in public and taking responsibility develop. Child-centered and early CRDE in line with children’s developmental levels is an important step in empowering child citizens and sustaining democracy. With children’s rights education in early childhood, children grasp the differences between wants, needs and rights, learn about abuse of children’s rights, and realize how their actions may affect others. As children learn about their own rights, they also discover that these are valid for all children, and that they must treat others responsibly and respectfully. As they learn about democratic values such as empathy, sensitivity, respect, love, tolerance, cooperation, helpfulness and sharing, their social adaptation skills improve and they have less conflict with others. This, in turn, improves the classroom atmosphere. When they are able to express themselves freely in such an environment, children’s self-confidence develops. They start to focus on “we” instead of “me” and their sense of belonging develops. In this way, children’s communication skills and socio-emotional development are supported, and they take more responsibility at school and in the society (Covell and Howe, 2001; Ersoy and Neslitürk, 2007; Freidmann, 2013; United Nations, 2012; Özdemir Uluç, 2008).

At CRDE’s core lies an approach which teaches children about life and helps them internalize their existence. If CRDE is not based on real life, it cannot fulfill its transformative role. It is more important to provide children with educational experiences to help them translate rights-related concepts and values into behavior, than teach democracy and human rights directly (Bulut Pedük, 2015). CRDE should be perceived as real life information, be implemented through participative age-proper classroom practices with the support of families, and span holistically from preschool to elementary, secondary, higher, disabled, gifted and informal education programs (Covell et al., 2008; Covell et al., 2010; Washington, 2010; Şirin and Gülhan, 2011; Demirezen et al., 2013).

In recent years, children’s rights education has gained increasing importance. However, the number of early childhood CRDE studies is rather limited in the literature. Further, many studies recommend that new ones be conducted focusing on the development of CRDE programs (Akman and Ertürk, 2011; Çakmak Güleç and Özdemir, 2006; Kızıltepe et al., 2014; Seyhan and Cansever, 2015; Washington, 2010). Also, most CRDE studies seem to focus on the views or attitudes of elementary school children, teachers and parents (Campbell, 2011; Goldberg, 2008; Sutton, 2003; Dalton, 1999; Temple, 1998; Ruck 1994; Çarkçı and Er, 2010; Dinç, 2015; Koran, 2015; Köse, 2009; Neslitürk and Ersoy, 2007; Yağan Güder and Yıldırım, 2014).

The limited number of studies focusing on children’s rights education in the early childhood period and the failure of most existing studies to focus jointly on children's rights and democracy education convinced the researcher that the development of a CRDE program for early childhood was essential. The current study therefore contributes to the literature and sets a practical example for teachers. It is also worth noting that the data obtained from the study serves as a guide in the field of
preschool education and an example for future CRDE research. With an early childhood program, teachers do not only gain raised awareness about children's rights, but also develop an idea about the methods and techniques they may implement CRDE with. The program will also act as an example for teachers as they develop richer learning environments by using the information gained from the program.

This study therefore aims to develop a “Children's Rights and Democracy Education Program” for the early childhood period and examine its effects on children’s democratic behaviors. Working with the question “What effect does children’s rights and democracy education have on children's democratic behavior levels?”, this study also seeks answers to the following sub problems:

1. What are the Democratic Behavior Scale equivalence levels of experimental (CRDE) and control group (non-CRDE) children?

2. Is there a difference between the Democratic Behavior Scale pretest - posttest scores of CRDE experimental and control groups?

3. Is there a difference between the Democratic Behavior Scale posttest mean scores of CRDE experimental and control groups?

4. Is there a difference between the Democratic Behavior Scale posttest - retention test scores of CRDE experimental group children?

**METHOD**

This study, which aims to identify the effects of CRDE on children's democratic behaviors, used the quantitative research method of the control group, quasi-experimental pretest - posttest - retention test design (Karasar, 2010). Considering that randomly assigning students to sections in an educational institution would hurt the existing class structure and order, the study used convenience sampling to establish the experimental and control groups (Büyüköztürk et al., 2018). The dependent variable in research design was the “democratic behaviors” of 48-72 month-old preschool children. The independent variable, whose effect on children's democratic behaviors was being studied, was the “Children's rights and democracy education program”. The experimental group in the study undertook the CRDE offered by the researcher in addition to the regular preschool educational program, while the control group continued the regular preschool educational program implemented by their teachers.

**The Study Group**

The study group consisted of two socio-culturally similar schools located in Melikgazi, Kayseri and the necessary permissions were obtained from the Directorate of National Education.

Experimental and control groups were determined based on the willingness of school principals and teachers to implement the education program. The study group included a total of 53 children, with the experimental group including 28 preschoolers aged between 60-72 months (14 female, 14 male), and the control group including 25 preschoolers aged between 60-72 months (11 female, 14 male). The demographic information of the study group, obtained with the permission of their families, are presented in Table 1 below.
Table 1. Frequency Distribution of Participants’ Demographic Information

<table>
<thead>
<tr>
<th>Group</th>
<th>Experimental</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Children’s Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>14</td>
<td>50</td>
<td>11</td>
</tr>
<tr>
<td>M</td>
<td>14</td>
<td>50</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Children's Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-72 months</td>
<td>28</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Duration of Preschool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 yil</td>
<td>8</td>
<td>28</td>
<td>13</td>
</tr>
<tr>
<td>2 yil</td>
<td>15</td>
<td>54</td>
<td>12</td>
</tr>
<tr>
<td>3 yil</td>
<td>5</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Mothers’ Age Bracket</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 and younger</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26-40</td>
<td>27</td>
<td>64</td>
<td>5</td>
</tr>
<tr>
<td>41-60</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Mothers’ Educational Background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Secondary School</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High School</td>
<td>3</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>University</td>
<td>17</td>
<td>61</td>
<td>16</td>
</tr>
<tr>
<td>Graduate</td>
<td>8</td>
<td>29</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Fathers’ Age Bracket</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 and younger</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26-40</td>
<td>24</td>
<td>86</td>
<td>24</td>
</tr>
<tr>
<td>41-60</td>
<td>4</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Fathers’ Educational</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Secondary School</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High School</td>
<td>2</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>University</td>
<td>21</td>
<td>75</td>
<td>19</td>
</tr>
<tr>
<td>Graduate</td>
<td>5</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
<td>25</td>
</tr>
</tbody>
</table>

Data Collection Tools

The data collection tools used in the study were the Child-Family Demographic Information Form, Democratic Behavior Scale for 48-72 Month-Old Children, and the children’s rights and democracy education program for 48-72 month-old children.
**Child-Family Demographic Information Form.** This form was prepared by the researcher in order to obtain demographic information and identify the characteristics of the study group. The form included questions about children's age and sex, and parents’ age and educational background.

**Democratic Behavior Scale.** Aimed for use with 48-72 month-old children, the Democratic Behavior Scale was developed by the researcher to measure the effects of the 11-week CRDE on children's democratic behaviors. The scale was used as pretest, posttest and retention test.

**Children’s Rights and Democracy Education Program.** This section presents information on the main philosophy of the CRDE and the program development process.

*The philosophy of the program.* The CRDE is designed in line with progressivism, reconstructionism and constructivism, which are based on pragmatist philosophy. The goal of CRDE is to achieve democratic individuals for a democratic society by making use of John Dewey’s educational approach and methods. Dewey’s approach renders students creative and dynamic. According to this approach, schools should equip students with problem-solving skills against all social life problems. Dewey saw creative problem-solution as a requirement of democracy. In line with these principles, the program takes into account individual and social differences, and offers activities that encourage students to construct knowledge by using active learning, creative problem-solving, questioning, and learning by doing and living (Bakır, 2007; Yeşiltas and Kaymakçı, 2009; Aydoğdu, 2011; Yalçınkaya, 2013; Şeker et al., 2014; Demirel, 2015; Aybek, 2017).

**Program Design.** CRDE program design included the following stages in line with the Ministry of Education’s Program Development Model (Demirel, 2015, p.57).

1. Needs analysis
2. Deciding on general goals
3. Deciding on the concepts, principles and skills in the field
4. Deciding on learning areas and corresponding objectives
5. Deciding on the themes included in the learning domain – Instructional activities-
   Measurement and evaluation
6. Obtaining expert views
7. Materials development
8. Submitting programs for approval
9. Implementing, monitoring and evaluating the program

1. *Needs Analysis* In the program development process, the researcher undertook needs analysis to ascertain whether there was a need for CRDE in addition to the existing preschool educational program (Arsal, 1998; Karacaoğlu, 2009). As an educator, the researcher used the unstructured natural observation technique to examine monthly plans and daily education flow in state schools during the 2016-2017 school year, and found that neither teacher plans nor their daily education flows adequately included children’s rights training or democracy education. Previous studies also corroborate the researcher’s observations (Washington, 2010; Akman and Ertürk, 2011; Seyhan and Cansever, 2015; Dinç, 2015).

The researcher also undertook literature review, evaluation of the existing program, and content analysis. She examined the CRDE literature, research in the field and the existing preschool education program. Following these, she started needs analysis with the Delphi method. A CRDE needs analysis questionnaire was designed driven by the information obtained from observations, the source review and content analysis.
Expert view was obtained from preschool education academics and teachers. After this, data were collected electronically from 82 participants by using the “Delphi Technique”. Of these participants, 53% stated that they did not have the necessary information to prepare CRDE activities. Ninety-eight percent agreed that “CRDE can be implemented in early childhood”. At the same time, 83% stated that they “make room for CRDE in their monthly plans”. However, CRDE activities were “limited to certain days or weeks” by 70%. Of the 82 participants, 94% believed that there was a need in early childhood for CRDE. Of these, 79% stated that such a program was necessary because studies focusing on this topic in early childhood were rare, 57% stated that the Ministry of Education program did not contain objectives in this topic, and 54% stated that sample CRDE activities were needed.

2. Deciding on general goals. General goals are determined in Turkey by the decision-makers in national education and define the characteristics of the ideal human expected by a given educational stage (Çelik, 2006; Sönmez, 2015). The general goals of Turkish national education and those of preschool education constitute the general goals of CRDE.

3. Deciding on the concepts, principles and skills in the field. The basic skills in the program reflect the framework of the convention for children's rights and democratic behaviors.

The principles of children's rights and democracy education are:

- Aiming for children to learn their rights
- Aiming to develop children's democratic behaviors
- Aiming to develop children's autonomy skills
- Putting the learner in the center as dictated by the constructivist approach
- Taking note of individual differences in educational activities
- Creating a democratic learning environment
- Defending freedom of speech, which is the basis of democracy, in all circumstances
- Being a role model for children by displaying democratic attitudes
- Teaching concepts and themes concretely and by considering children’s developmental characteristics through educational activities
- Making use of opportunity education
- Recycling objectives for permanent learning
- Planning educational activities around children’s daily lives, in line the principle of moving from near to far (Uçuş Güldalı, 2017).

4. Deciding on learning domains and corresponding objectives. As CRDE was being prepared, related objectives in the MoNE preschool educational program (2013) were found. Following this, new objectives were written for the aims not included in the MoNE program. As the researcher identified new objectives, she did a literature review and evaluated the developmental characteristics of 48-72 month-old children. Each CRDE objective was developed by ensuring that it contains a statement focusing on behavior, is measurable and observable. A hierarchical order was followed in the objective indicators in line with the Taxonomy Approach (from simple to complex, concrete to abstract, near to far).
5. **Deciding on the themes included in the learning domain – Instructional activities- Measurement and evaluation.** In CRDE, themes are developed in line with the Convention on Children's Rights and democratic behaviors. The themes and objectives in the program support one another. The researcher prepared 40 activities for the program for 48-72 month-old children. These activities include themes to teach children's rights and develop democratic and autonomous behaviors. As necessitated by the Convention on Children's Rights, these themes include the family and alternative care, peace, environment, democracy, avoiding discrimination, education and free time, participation, media and the internet, health and well-being, violence, gender equality. The themes included in the program to encourage the development of autonomous behaviors are self-recognition, self-confidence, communication, innovative thinking, problem-solution, democracy, participation in decision-making, and following rules. In order to develop democratic behaviors, program activities focused on the themes of empathy, cooperation, responsibility, patience, respect, tolerance, sharing, helpfulness, observing rules, participating in decision making, negotiating, and sensitivity. The activities were child-centered and constructivist. There were both small and large group work. In order to enable children to learn by living, a process-based approach was adopted. The hidden curriculum created by student interaction and the classroom environment was also considered in order to help children learn via their experiences in the process. The activities regularly recycled the program objectives, thus attempting to create permanent learning. Different learning methods and techniques were used in conjunction so that the activities would arouse children’s curiosity and keep their attention alive. Considering the importance of affect in learning, the activities invited children to use their senses and gave them emotions such as excitement, curiosity, love and empathy within the process.

CRDE measurement and evaluation was two-fold. The initial evaluation took place at the end of each activity plan in the form of student self-evaluation and evaluation of the day, while the final one was completed by using the researcher’s Democratic Behavior Scale, which aimed to discover the effects of the program on children's behaviors and was developed in line with the program objectives.

1. **Obtaining expert views.** All of the 40 CRDE activities were evaluated by a total of 6 experts — two preschool teachers, one curriculum development academic with a PhD, two full professors and an associate professor in the field of preschool education. Following expert opinion, the activities were designed in line with the child-centered approach.

2. **Materials Development.** Out of the 40 program activities, 29 were developed by the researcher and 11 were adapted from the literature (MoNE O.Ö.E.P. Activity Book, 2013; Flowers, 2010; Sapsaçlam and Ömeroğlu, 2016, Yalçın et al., 2012).

3. **Submitting programs for approval.** Approval to implement the program was obtained from Hacettepe University Ethics Commission and Kayseri Provincial Directorate of National Education. Additionally, permissions were taken from the families of experimental and control group children.

4. **Implementing, monitoring and evaluating the program.** The pilot trial used 10 randomly selected activities from the program. During the trial, the activities were observed to be appropriate for the children's age group and also interesting for the children. Time needed was 40 minutes for integrated activities. The pilot trial did not necessitate any changes or revisions to the activities. The program was implemented in the kindergarten of an elementary school located in Melikgazi, Kayseri three days weekly for 11 weeks.
Data Analysis

The data collection tools used in the study were the “Child-Family Demographic Information Form” and “Democratic Behavior Scale”. The demographic information obtained from the Child-Family Demographic Information Form was presented by using frequencies (f) and percentages (%). When analyzing the data form the Democratic Behavior Scale, the first step was to explore whether the pretest, posttest and retention test scores displayed normal distribution in each group to be compared. The Shapiro-Wilk Test was used for this purpose. The differences between the paired groups who were not normally distributed were examined with the Mann Whitney U test, while the differences between the dependent variables who were not normally distributed were examined by using the Wilcoxon Test. The significance level was set at 0.05, with p<0.05 showing a significant difference and p>0.05 showing its lack.

FINDINGS

The findings concerning the subproblems of the study are presented below.

1. Findings about the Equivalence Levels of CRDE Experimental and Control Groups

Whether the democratic behavior levels of experimental and control groups varied statistically prior to CRDE was examined by using scores from the knowledge of rights, democratic behaviors and autonomous behaviors subdimensions, as well as the total score from the scale. In this way, the equivalence level of experimental and control groups was explored.

Table 2. Mann-Whitney U Test Results of DBS Used as Pretest

<table>
<thead>
<tr>
<th>Democratic Behavior Scale</th>
<th>n</th>
<th>x̄</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>sd</th>
<th>Mean ranks</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of Rights</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>28</td>
<td>21</td>
<td>19</td>
<td>9</td>
<td>45</td>
<td>9.3</td>
<td>25</td>
<td>-0.86</td>
<td>0.386</td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>23</td>
<td>22</td>
<td>9</td>
<td>42</td>
<td>9.3</td>
<td>28</td>
<td>-1.59</td>
<td>0.113</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>22</td>
<td>19</td>
<td>9</td>
<td>45</td>
<td>9.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Democratic Behaviors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>28</td>
<td>70</td>
<td>69</td>
<td>39</td>
<td>95</td>
<td>12.8</td>
<td>30</td>
<td>-1.59</td>
<td>0.113</td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>63</td>
<td>67</td>
<td>35</td>
<td>89</td>
<td>14.1</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>67</td>
<td>69</td>
<td>35</td>
<td>95</td>
<td>23.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous Behaviors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>28</td>
<td>33</td>
<td>33</td>
<td>17</td>
<td>49</td>
<td>8.5</td>
<td>28</td>
<td>-0.60</td>
<td>0.550</td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>31</td>
<td>33</td>
<td>10</td>
<td>45</td>
<td>10</td>
<td>26</td>
<td>-0.70</td>
<td>0.487</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>32</td>
<td>33</td>
<td>10</td>
<td>49</td>
<td>9.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>28</td>
<td>125</td>
<td>118</td>
<td>82</td>
<td>181</td>
<td>26</td>
<td>28.3</td>
<td>-0.70</td>
<td>0.487</td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>117</td>
<td>124</td>
<td>67</td>
<td>174</td>
<td>30</td>
<td>25.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>121</td>
<td>121</td>
<td>67</td>
<td>181</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to reveal the effects of CRDE, the Democratic Behavior Scale was implemented on experimental and control groups prior to implementing the educational program. The Mann Whitney U Test results of the pretest scores are presented in Table 2.

The findings show no significant difference between the Knowledge of Rights (z=-0.86; p>0.05), Democratic Behaviors (z=-1.59; p>0.05), Autonomous Behaviors (z=-0.60, p>0.05) subdimension scores and the total Democratic Behavior Scale (z=-0.70, p>0.05) mean scores of the
experimental and control groups. The analysis results showed that the democratic behavior levels of groups were similar, and any difference to occur in the democratic behavior levels would depend on the procedures implemented in the experimental and control groups.

2. Findings about the Democratic Behavior Scale Pretest - Posttest Scores of the Experimental and Control Groups

The Wilcoxon test performed to explore whether there was a significant difference between the experimental group’s Knowledge of Rights, Democratic Behaviors, Autonomous Behaviors and total DBS pretest-posttest mean scores yielded the results given in Table 3 below.

Table 3. Experimental Group Pretest-Posttest Wilcoxon Test Results

<table>
<thead>
<tr>
<th>Democratic Behavior Scale</th>
<th>Experimental group</th>
<th>Wilcoxon Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>x̄</td>
</tr>
<tr>
<td>Knowledge of Rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>28</td>
<td>21</td>
</tr>
<tr>
<td>Posttest</td>
<td>27</td>
<td>43</td>
</tr>
<tr>
<td>Democratic behaviors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>Posttest</td>
<td>27</td>
<td>91</td>
</tr>
<tr>
<td>Autonomous Behaviors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>28</td>
<td>33</td>
</tr>
<tr>
<td>Posttest</td>
<td>27</td>
<td>46</td>
</tr>
<tr>
<td>Total Scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>28</td>
<td>125</td>
</tr>
<tr>
<td>Posttest</td>
<td>27</td>
<td>181</td>
</tr>
</tbody>
</table>

Table 3 shows that, in the DBS Knowledge of Rights subdimension, the posttest mean scores ($\bar{x}=43$) of the experimental group were significantly higher than their pretest mean scores ($\bar{x}=21$) ($z=-4,46$; $p<0,05$). Similarly, in the Democratic Behaviors subdimension, posttest mean scores ($\bar{x}=91$) were significantly higher than pretest mean scores ($\bar{x}=70$) ($z=-4,40$; $p<0,05$). In the Autonomous Behaviors subdimension, posttest mean scores ($\bar{x}=46$) were significantly higher than pretest mean scores ($\bar{x}=33$) ($z=-4,35$; $p<0,05$). As for the total DBS mean scores, posttest mean scores ($\bar{x}=181$) were significantly higher than pretest mean scores ($\bar{x}=125$) ($z=-5,54$; $p<0,005$). The results show that the CRDE contributed positively to children's democratic behaviors.

Table 4 shows the results of the Wilcoxon test performed to see whether a significant difference exists between the Knowledge of Rights, Democratic Behaviors, Autonomous Behaviors and total Democratic Behavior Scale pretest-posttest mean scores in the Control group.
Table 4. Control Group Pretest-Posttest Wilcoxon Test Results

<table>
<thead>
<tr>
<th>Democratic Behavior Scale</th>
<th>Control group</th>
<th>Wilcoxon Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>x</td>
</tr>
<tr>
<td>Knowledge of Rights</td>
<td>Pretest</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>21</td>
</tr>
<tr>
<td>Democratic behaviors</td>
<td>Pretest</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>21</td>
</tr>
<tr>
<td>Autonomous Behaviors</td>
<td>Pretest</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>21</td>
</tr>
<tr>
<td>Total Scores</td>
<td>Pretest</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 4 reveals no significant difference between the Knowledge of Rights pretest (\(\bar{x}=23\)) and posttest mean scores (\(\bar{x}=27\)) in the control group (\(z=-1,15; p>0,05\)). In the Democratic Behaviors subdimension too, no significant difference existed between pretest (\(\bar{x}=63\)) and posttest mean scores (\(\bar{x}=69\)) (\(z=-1,61; p>0,05\)). Similarly, the Autonomous Behaviors subdimension pretest (\(\bar{x}=31\)) and posttest mean scores (\(\bar{x}=36\)) did not vary significantly (\(z=-1,80; p>0,05\)). Considering the total DBS mean scores, no significant difference was observed once again between the pretest (\(\bar{x}=118\)) and posttest mean scores (\(\bar{x}=132\)) (\(z=-1,72; p>0,05\)).

These results reveal that education based on the existing preschool educational program increases the democratic behavior levels of control group children, albeit not significantly.

3. Findings on the CRDE Experimental and Control Group Posttest Scores

The Mann-Whitney U test was performed to explore whether experimental and control group children’s Democratic Behavior Scale posttest mean scores varied significantly. The results are presented below.

Table 5. Mann-Whitney U Test Results of DBS Used as Posttest

<table>
<thead>
<tr>
<th>Democratic Behavior Scale</th>
<th>Group</th>
<th>Mann-Whitney U test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>x</td>
</tr>
<tr>
<td>Knowledge of Behaviors</td>
<td>Experimental</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
</tr>
<tr>
<td>Democratic Behaviors</td>
<td>Experimental</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
</tr>
</tbody>
</table>
Comparing the experimental group children’s posttest mean scores in the Knowledge of Rights ($\bar{x}=44$), Democratic Behaviors ($\bar{x}=91$), Autonomous Behaviors ($\bar{x}=46$) subdimensions and the DBS total ($\bar{x}=181$) mean score and the control group children's posttest mean scores in the Knowledge of Rights ($\bar{x}=27$), Democratic Behaviors ($\bar{x}=69$), Autonomous Behaviors ($\bar{x}=36$) subdimensions and the DBS total ($\bar{x}=132$) mean score, it was found that the scores of the experimental group in the subdimensions and the total scale were higher. In addition, the findings also showed that a significant difference in favor of the experimental group existed between the two groups’ Knowledge of Rights ($z=-5.6; p<0.05$), Democratic Behaviors ($z=-4.9; p<0.05$), Autonomous Behaviors ($z=-4.5, p<0.05$) and DBS total ($z=-5.0, p<0.05$) posttest mean scores. These findings suggest that the CRDE implemented in the experimental group brought a significant increase in children's democratic behaviors.

4. Findings on the CRDE Experimental Group Retention Test Scores

The Wilcoxon test results showing the relationship between the experimental group’s Knowledge of Rights, Democratic Behaviors, Autonomous Behaviors subdimension scores and total DBS posttest-retention test mean scores are presented in Table 6.

<table>
<thead>
<tr>
<th>Democratic Behavior Scale</th>
<th>Experimental group</th>
<th>Wilcoxon test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>$\bar{x}$</td>
</tr>
<tr>
<td>Knowledge of Rights</td>
<td>Posttest</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Retention Test</td>
<td>27</td>
</tr>
<tr>
<td>Democratic Behaviors</td>
<td>Posttest</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Retention Test</td>
<td>27</td>
</tr>
<tr>
<td>Autonomous Behaviors</td>
<td>Posttest</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Retention Test</td>
<td>27</td>
</tr>
<tr>
<td>Total Scores</td>
<td>Posttest</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Retention Test</td>
<td>27</td>
</tr>
</tbody>
</table>

The experimental group’s Democratic Behavior Scale posttest and retention test mean scores showed that there was no significant increase in the retention ($\bar{x}=43,3$) and posttest ($\bar{x}=43,5$) scores in the Knowledge of Rights subdimension ($z=-0,3; p>0,05$). In the democratic behaviors subdimension,
a significant increase existed in the retention test ($\bar{x} = 93$) ve posttest ($\bar{x} = 91$) mean scores ($z = -0.3; p<0.05$). In the experimental group's Autonomous Behaviors subdimension, there was an insignificant increase in the retention ($\bar{x} = 48$) and posttest ($\bar{x} = 46$) mean scores ($z = -1.5; p>0.05$). Finally, the experimental group's DBS total mean scores also showed an insignificant increase in the retention test ($\bar{x} = 184$) and posttest ($\bar{x} = 181$) mean scores ($z = -1.9; p>0.05$). These findings suggest that the CRDE which was implemented retained its positive effect on children's democratic behaviors. This is to say that the effect of the CRDE on experimental group children's democratic behaviors continued beyond the program.

**DISCUSSION**

The CRDE is a child-centered program including activities to develop the knowledge, skills, attitudes and behaviors necessary for children to gain a culture of democracy. Starting the CRDE in early childhood when learning is at its fastest is essential for Human Rights Education to reach its goals and for the formation of modern and democratic societies. After the CRDE, which was implemented in the experimental group in addition to the current preschool educational program, the experimental group posttest mean scores in the Knowledge of Rights subdimension ($\bar{x} = 43$) were significantly higher than pretest mean scores ($\bar{x} = 21$) ($z = -4.46, p<0.005$).

The DBS Knowledge of Rights subdimension measures children’s awareness levels of the CRC’s protection, development and participation rights. This finding overlaps with the findings of Washington's study regarding the development and implementation of a Family Involvement Children's Rights Education Program. Washington (2010) concluded in his study that experimental group children gained awareness of CRC with the help of the program. Pettman et al. (1986) developed a program to teach human rights to preschoolers and grade 1-4 students and emphasized that human rights training and human values may be taught through objective methods. Also, Decoe and De cock (1996) concluded in a children's rights educational program for 3-12 year-old children that there is a mutually increasing relationship between children's values regarding general rights.

Similarly, Covell and Howe (1999) developed a children's rights educational program and found that children who received children's rights education had more comprehensive and accurate children's rights information than those who did not receive similar education, and that these children embraced minority children more than others. In studies conducted at different levels of education, it was seen that children's rights education increased children's awareness of their rights (Golberg, 2008; Covell and Howe, 2001; Uçuş, 2014; Demirezen et al., 2013; Torun and Duran, 2014; Kaymak Özmen et al., 2014; Hareket, 2015; Hareket, 2018).

As can be understood from these research findings, experimental group children who took part in the training program had increased awareness of their rights to live, develop and be protected. Baydar and Yazıcı (2015) aimed to determine 60-72 month-old children's perceptions of children's rights in their study, and found that the majority referred to the development right in their statements, while more than half mentioned the right to live, and almost half mentioned the protection right. Baydar and Yazıcı’s findings support the view that rights education should start in early childhood. In a study evaluating preschool teachers’ views about children's rights, Kor (2013) found that teachers thought the items in CRC mentioning the rights of life, development, health and education can help develop awareness in early childhood children. Also, Ruck (1994) examined the development of children’s personal decisiveness and their perceptions of care and protection rights, and found no relationship between increasing care, protection questioning skills, and age. Quennerstedt (2016) observed the daily activities of a group of children aged between 1 and 3 years in order to examine how they acquired the laws of human rights in the preschool education environment. He concluded that children’s behaviors were frequently concerned with human rights and defined children's rights in three different domains: belonging, effect and equality.

Özdemir Uluç (2008) stated that “if children's rights education is successful, children’s awareness of their rights and their interest in the protection and promotion of children's rights will definitely increase”. In the early childhood period, as children perceive the concept of rights in a self-
centric way and through concrete realities, they need to be provided with a democratic education program that will enable them to turn democracy and human rights information into values, behaviors and attitudes (Neslitürk and Ersoy, 2007; Özdemir Uluç, 2008; Washington, 2010; Uçuş, 2014; Seyhan and Cansever, 2015).

The posttest mean scores in the Democratic Behaviors subdimension of DBS ($\bar{x}=91$), which was implemented on experimental group children after the CRDE, were significantly higher than the pretest mean scores ($\bar{x}=70$) ($z=4.40; p<0.05$). The democratic behaviors subdimension measured social development behaviors that every human being needs for the development of a democratic culture, such as obeying rules, participating in decisions, cooperation, sharing, helping others, respect and tolerance. Democracy education, starting at home and continuing at school, is an essential element to raise individuals with a democratic culture. Erwin and Kipness (1997) claim, “democracy can be clearly understood in the early childhood period as a value.” According to Kuş, Sönmez and Karatekin (2011), democracy education is a whole consisting of parts such as the family, environment, school, management style and culture, and democracy is a value that can best be learned through living. Therefore, teachers must make sure that they act as role models so that children experience democracy through a democratic method, classroom interaction and climate in the instructional process. Mapiasse (2007) studied the effects of a democratic classroom climate on students’ participation and learning output, and concluded that a democratic climate has important effects on student participation, interpretation skills and the concept of citizenship. Subba (2014) pointed out in a study that democratic ideals such as equality, freedom and justice are given to individuals at school; teachers are a crucial factor in this; democracy education can help shape children into citizens who will defend democracy in the future; and therefore it needs to take place as early as possible. Sundawa (2015) concluded that using the classroom as a democracy laboratory has a powerful effect in improving students’ democratic skills and that teachers play an important role in helping students develop a democratic character at school. Bulut Pedük (2015) emphasized the importance of educating children via democratic attitudes in a democratic environment and giving them responsibilities in children's rights education. Özdemir Doğan (2017) studied effective children's rights education with classroom teachers. The teachers believed that students should be taught their rights and responsibilities through active participation and learning by doing; that a school culture needs to be built; and that children must learn not only about their rights but also about their responsibilities. Lowry (2002) stated that democracy is a moral behavior and claimed that democracy education will provide equality in the classroom and facilitate problem-solution.

The Autonomous Behaviors subdimension of the DBS implemented on experimental group children after the CRDE showed that their posttest mean scores ($\bar{x}=46$) were significantly higher than pretest mean scores ($\bar{x}=33$) ($z=-4.35; p<0.05$).

The DBS Autonomous Behaviors subdimension measures the levels of behaviors in the social and cognitive development area, such as asking questions, doing research, solving problems, initiating and maintaining conversation, voicing opinions, and defending one’s own and other people’s rights, which every individual needs to possess for a democracy culture to flourish. In a democratic society, individuals should learn ample and diverse information about political, social and cultural issues, not just from their immediate environment but from diverse sources. This is related to the development of autonomous learning skills which are essential to a democratic culture (COE, 2016).

Societies with a democratic culture can only be formed if their members are raised as free-thinking, expressive, decision-making, questioning, critiquing, researching, problem solving, self-confident and autonomous individuals who have a realistic view of themselves. Raising individuals with these traits is only possible through an education that promotes democratic culture and starts in early childhood, an important stage in children's character development (Yılmaz and Ölçer, 2018). Democracy education equips individuals not only with the necessary attitudes and behaviors to engage actively with the society, but also with autonomy and social skills necessary to identify and pursue their own goals. Ak (2016) contends that democracy in preschool means children being able to make decisions about their own lives. With a democratic approach, children come to understand themselves
as they contribute to the social and group consciousness. This improves self-efficacy, self-development, self-experience, self-responsibility, and self-control skills (Dürr, 2005; Elkatmış, 2007). On the other hand, high student autonomy encourages children to develop their self-regulation and decision-making skills and increase their motivation level. Becoming a lifelong learner connotes high student autonomy (Yılmaz and Ölçer, 2018).

Yavuz (2016) writes that student autonomy also means that the student is the subject in the decisions made in their learning process. According to Ölçer and Yılmaz (2019), autonomy is the ability to be aware of one’s self, to think freely and decide, to put one’s decisions into action, to act independently and sincerely, and to make choices. Individuals’ behaviors such as feeling confident about their choices, resisting peer and parent pressure while displaying appropriate social responsibility, having control over their behaviors, feeling self-confident, and being able to make decisions without getting socially affected depend on the development of autonomous behaviors (Yılmaz and Ölçer, 2018). An autonomous individual is not scared to show their presence and defend themselves when necessary. Autonomous individuals know what they want and how they can get it, thus having control and responsibility over their lives. Autonomous individuals are aware of their own wants, and they make it known to others through their behaviors that they have the “right to choose” (Ersoy Kart and Güldü, 2008).

According to the competencies for a democratic culture model, autonomous learning skills are necessary for individuals to organize and evaluate their own learning according to their own needs, with their own guidance and no help from others. Individuals with autonomous learning skills can identify their own learning needs and reach the sources they need to fulfill these needs. They test the resulting information for bias and manipulation. They then process it with their own skills, attitudes and values. They evaluate the learning strategies used and make conclusions by using new information and new learning strategies (COE, 2016).

The CRDE emphasized the development of autonomous learning skills in children, and activities were planned to support children’s learning within this process. The results showed that the CRDE benefited children's autonomy behaviors.

The total DBS mean scores of the experimental group after CRDE showed that their posttest mean scores (\(\bar{x}=181\)) were significantly higher than their pretest mean scores (\(\bar{x}=125\)) (\(z=-5.54; p<0.005\)). Regarding the retention test mean scores in the experimental group, no significant increase occurred in the Knowledge of Rights (\(\bar{x}_i=43.3; \bar{x}_s=43.5\)) and Autonomous Behaviors (\(\bar{x}_i=48; \bar{x}_s=46\)) subdimensions and the total score from the scale (\(\bar{x}_i=184; \bar{x}_s=181\)); however, a significant increase was detected in the democratic behaviors subdimension (\(\bar{x}_i=93; \bar{x}_s=91\)) (\(z=-0.3; p<0.05\)). These findings suggest that the positive effects of CRDE on children’s democratic behaviors retained their permanence and continued after the program.

CRDE aims to raise 21st century citizens and is based on the theory of multiple intelligences. It therefore strives to serve the nature, characteristics and strengths of each individual in the group; encourages children's curiosity and love for learning; is process-oriented rather than product; is innovative; and taps into students’ critical thinking skills. It encourages the values of sustainability and environmental responsibility, as well as participation in society and multiculturism. The program aims to raise independent, responsible, cooperative, self-aware, sensitive and empathetic individuals with respect for differences.

With its roots in constructivism, the program was developed by using a rights-based approach, which brings together the components of the instructional process, method and materials. It does not ask children to memorize information; rather, it encourages them to learn by doing, to construct, make meaning, interpret and transfer their knowledge when necessary.

Play-based activities have priority, and cooperative educational events in which children work towards a shared goal in pairs and teams are organized. These educational activities are evaluated
together with children, encouraging them to express their feelings and thoughts and to compliment
their peers when necessary. Their needs and expectations for future educational events are elicited.
Naturally, a program in which children learn by doing, living and having fun in a positive classroom
atmosphere with close child-teacher relationships led to an effective process both for the researcher
and the children. In an attempt to review children's rights education studies at preschools, Topsakal
and Sadıkoğlu (2017) examined studies in preschool education and preschool curricula. They
concluded that a very limited number of studies focused on children's rights education in preschools; a
rights education program based specifically on children’s rights was necessary in preschool education;
children's rights education was also necessary for families, teachers and all other individuals that come
into contact with children; and there is a need for high-quality scientific studies.

This CRDE program development study is among the few in Turkey that focus jointly on
early childhood and children's rights and democracy education. The results showed that the program
was appropriate and effective in the early childhood period. It is therefore expected to provide an
example to early childhood teachers and researchers.

CONCLUSIONS

The aim of this study was to examine the effects of an early childhood CRDE on children's
democratic behaviors. In order to do so, the researcher developed a CRDE program and implemented
it on an experimental group of children for 11 weeks. The results are listed below. The effects of
CRDE were analyzed by implementing the Democratic Behavior Scale developed by the researcher on
experimental and control groups as pretest, posttest and retention test.

1. Prior to CRDE, no significant difference existed between the pretest scores of
experimental and control groups. Based on this, it was concluded that experimental and
control groups’ democratic behavior levels were similar in all subdimensions (knowledge
of rights, democratic behaviors, autonomous behaviors). As the total score from the scale
was also similar in the two groups, it was decided that any future difference in the
democratic behavior levels could be attributed to the procedures to take place.

2. The posttest mean scores of the experimental and control groups after CRDE showed that
the former scored significantly higher in all subdimensions and the total scale.

3. The DBS pretest and posttest mean scores in the experimental group after CRDE revealed
a statistically significant increase in all subdimensions and the total scale.

4. The DBS pretest and posttest mean scores in the control group after CRDE showed no
statistically significant increase in any of the subdimensions or the total scale.

5. The DBS posttest and retention test mean scores of the experimental group revealed no
significant increase in the knowledge of rights or autonomous behaviors subdimensions, a
statistically significant increase in the democratic behaviors subdimension, but none in
the total mean scores from the scale.

Recommendations

Recommendations for research:

- In this study, 60-72 month-old preschoolers underwent an 11-week children’s rights and
democracy education program which was developed by the researcher to instil democratic
behaviors in early childhood. The program was confirmed to have a positive effect on 60-
72 month-old children's democratic behaviors, and its effectiveness with other age groups
awaits further examination.
• Children's rights and democracy education may be tested for its effects on the democratic behaviors of children from different socioeconomic and sociocultural backgrounds and with different developmental characteristics.

• In this study, children's democratic behavior levels were examined with the help of the DBS completed by preschool teachers. As the scale is also fit for parent use, children's democratic behavior levels may also be studied based on parent views, therefore allowing an exploration of children's democratic behavior levels through their families’ observations.

Recommendations for practice:

• The study showed that the 11-week Children’s Rights and Democracy Education program had positive effects on children's democratic behaviors. The implementation of this program may be made widespread by cooperating with the National Education Directorates.

• Preschool teachers may be offered in-service training sessions and seminars on children's rights and democracy education in early childhood in order to guide them as they develop activities and practices to support children's knowledge of their rights and democratic behaviors.

• Children's development is greatly influenced by family attitudes, behaviors and knowledge levels. Therefore, families may be trained in teaching their young children to display rights-based democratic attitudes and behaviors, and in this way support the development of democratic behaviors in them.

• In the national literature, there is a need for sources on children's rights and democracy education in early childhood. Publications may target training academics, teachers and families in “Children's Rights and Democracy Education in Early Childhood”. In order to benefit children, illustrated children's rights and democracy books and activity handbooks may be written, and children's rights workshops may be organized.

REFERENCES


COE. (2016). Demokrasi kültürünü için yetkinlikler. Link: https://rm.coe.int/16806ccf18


Primary School Students' Images of Scientists and the Sources of These Images

Ebru Buket Aygun i
Ataturk University

Suat Celik ii
Ataturk University

Abstract

The aim of this study is to determine the 4th-grade students’ images of the scientists and the relations between these images and the images of scientists that primary school teachers describe in their classes and the images presented in the 4th-grade textbooks. The sample of the study consisted of 244 4th-grade students, 10 teachers, and 4th grade science and social studies textbooks. The study was designed according to the case study design, which is one of the qualitative research designs. As a result of the study, it has been determined that the students have stereotypical images about gender, age, working environment, and the works of the scientists. While it was determined that 85% of the students draw male scientists. However, contrary to the results commonly seen in the literature, the image of a scientist with a lab coat is found to be at a lower level in this study. In addition, the results obtained in the interviews with the teachers and textbooks examined revealed that there are similarities between these images that the students have and the images that the teachers have taught and the images presented in the textbooks.

Keywords: Images of Scientist, Primary School Students, DAST, Primary School Teacher, Textbooks

DOI: 10.29329/ijpe.2022.426.11

-----------------------------

i Ebru Buket Aygun, Department of Elementary Education, Ataturk University, ORCID: 0000-0003-1503-4820

ii Suat Celik, Assoc. Prof. Dr., Department of Mathematics and Science Education, Ataturk University, ORCID: 0000-0001-9858-2165

Correspondence: celiks@atauni.edu.tr
INTRODUCTION

The main aim of science education is accepted as having scientifically literate individuals (AAAS, 1993; NRC, 1996). In a world full of scientific research products in the 21st century, scientific literacy is a need for every individual (Bybee, 1995; Hurd, 1998). For this purpose, the Science and Technology lesson curriculum, which changed with the reform of the primary education curriculum in our country in 2005, by the Ministry of National Education (MONE), adopted the vision of "educating all students as science and technology literate" unlike the previous programs (MEB, 2005; 2013; 2018). Scientific literacy requires having a realistic understanding of how the scientific process works and who the scientists, who are an important subject of this process, what characteristics they have, and how they continue their studies. (Brown, Grimbeek, Parkinson, and Swindell, 2004; Hurd, 1998; McComas, 2017). Students' understanding of science and scientists will have important long-term effects for both individuals and society (Schibeci, 2006; Newton & Newton, 1998). For this reason, examining images of scientists among students together with these images presented in lessons by their teachers and presented in textbooks, which are the two important components of school life and which are the source of these images, will guide the education process in having scientific literate individuals.

One of the earlier research about students’ images of scientists was conducted by Mead and Metraux (1957). The result of this study is that scientists are mostly male, working in the laboratory, a white coat, glasses, old, tired, in a laboratory full of test tubes and bottles, and shouting "I found, I found". There has been much research on the images of students about scientists after this study (Akcay, 2011; Chiang and Guo, 1996; Lee and Kwon, 2019; Newton and Newton, 1992, 1998; Tuckey, 1992). The results of these studies also revealed that students mostly have stereotyped images of scientists (Blagdanic, Kadijevic, and Kovacevic, 2019; Finson, 2002; Miller, Nolla, Eagly, and UUtal, 2018; Schibeci, 2006). Research on images of scientists and science among students have been done mostly in the USA and Europe. Toğrol’s (2000) study is one of the earlier research on the images of Turkish students about scientists. After this study, many studies were carried out on different samples (Baday, 2019; Baybars, 2018; Buldu, 2006; Çakıcı, 2018; Çermik, 2013; Demirbaş, 2009; Küçük ve Bağ 2016; Özdeş ve Aslan, 2019; Özgelen, 2012; Toğrol, 2013;Türkmen, 2008). Türkmen (2008), in his study, determined that the source of students’ understandings about scientists is mostly teachers. Similarly, Çakıcı (2018), in his study stated that while there was diversity regarding the images kindergarten and elementary school students have, the perceptions of middle school students were stereotyped.

It is stated that television, books, curriculum, textbooks, and teachers are generally effective in forming the images of children about scientists (Ağgül-Yalçın, 2012; Baday, 2019; Çakıcı, 2018; Driver, Leach, and Millar, 1996; Newton and Newton, 1998; Özgelen, 2012; Türkmen, 2008). However, among all these factors, the effects of teachers and textbooks with whom they interact very intensely in the development of the image of the scientist of students stand out one step further than others (Baday, 2019; Türkmen, 2008). She (1995) states that textbooks are effective at a certain level in the formation of scientist images of children. Another study stated that stereotypes about scientists are lower among students in lower grades compared to other upper ones (Narayan, Park, Peker, and Suh, 2013).

Although it is stated in these studies that students have are stereotypical images about a scientist and that textbooks play an active role in these images, there is a few studies that have been conducted on examining the textbooks. Images about scientists among students and the effects of their teachers and textbooks, which are two important components of school life, in the formation of these images, should be better understood. However, in the studies conducted so far, it has been determined that the scientist images of the students are mostly handled independently from the source of these images. In this study; unlike previous studies, it was aimed to reveal the associations between the images of scientists the students have and the images the teachers taught, and the images in the textbooks. The following questions were investigated in the study:
1. What are 4th-grade students’ images about scientists?

2. What similarities or differences are there between the images 4th-grade students have and the images that teachers tell about scientists in their lessons?

3. What similarities or differences are there between the images primary school 4th-grade students have and the images in the textbooks about scientists?

**METHOD**

The study was planned according to the case study design, which is one of the qualitative research designs. In a case study detailed data is collected about a current limited situation in real life or multiple situations in a certain time period through multiple information sources such as audio-visual materials, documents, interviews, or reports (Creswell, 2013). The case study design was used as it was aimed to reveal the connections between the scientist images of the students and the scientist images taught in schools and the images included in the textbooks.

**Sample**

The sample of the study involved 244 4th grade students (9-10 years old) studying in the city center of Gümüşhane in the 2017-2018 academic year, 10 classroom teachers of these students, and science and social studies textbooks. The participants of the study were determined according to the convenient sampling method. Due to the limitations in terms of labor, money, and time the sample consists of easily accessible and practicable units this method was used (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2016).

**Data Collection**

Data were collected in three phases. In the first phase, the students were asked to draw a scientist using Draw A Scientist Test (DAST), developed by Chambers (1983), and to explain their drawings briefly in writing in order to prevent them from being understood differently from what they were trying to explain. In the second phase of the study, the images about scientists in the fourth-grade science (Kaya, 2017) and social studies (Evirgen et al., 2017) textbooks were examined. In the last phase of the study, a semi-structured interview was managed with the teachers to examine whether there is any connection between the scientist images of the students and the images taught. Questions about scientists and how they teach about scientists were asked to the teachers.

**Data Analysis**

To analyze students’ drawings, a checklist for DAST-C developed by Finson et al. (1995), was used. The drawings of the students who did not completed them at the end of the application were excluded from the analysis. In order to increase the consistency of the analysis, the students were asked to explain the pictures they drew in order not to make wrong interpretations about the scientist they drew. In order to ensure the reliability of the data analysis, the data of 35 random students were re-examined. The reliability of the analysis is $\alpha = 93$.

**RESULTS**

As results in Table 1. it is seen that the students mostly draw scientists with glasses with a ratio of 21% regarding the external appearance of the scientist. It was determined that 12% of the students drew scientists wearing lab coats, while 15% drew scientists with complex facial hair, beard, and mustache. While it was determined that 85% of the students draw a male scientist, 13% a female scientist, and it was found that only one student draw a female scientist and a male scientist working together. Examples of these kinds of drawings are presented in Figure 1. and 2.
Table 1. Appearance and gender of the scientists

<table>
<thead>
<tr>
<th></th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glasses</td>
<td>49</td>
<td>21</td>
</tr>
<tr>
<td>Facial Feathers</td>
<td>36</td>
<td>15</td>
</tr>
<tr>
<td>Lab Coat</td>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td>Male</td>
<td>200</td>
<td>85</td>
</tr>
<tr>
<td>Female</td>
<td>31</td>
<td>13</td>
</tr>
<tr>
<td>Male and Female</td>
<td>1</td>
<td>.4</td>
</tr>
</tbody>
</table>

N=236

Sample drawings of the students regarding the gender of the scientist are in the following. In Figure 3, the student stated that he drew Einstein. In Figure 4, one of the students drew a picture of a female scientist. In Figure 5, a student drew a male and a female scientist working together.
Figure 5. Drawing of a Male and Female Scientist Working Together (S72)

Table 2. Use of research, information, technology, text expressions, danger, and confidentiality statements:

<table>
<thead>
<tr>
<th></th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Symbols</td>
<td>133</td>
<td>56</td>
</tr>
<tr>
<td>Information Symbols</td>
<td>58</td>
<td>25</td>
</tr>
<tr>
<td>Technological tools</td>
<td>107</td>
<td>45</td>
</tr>
<tr>
<td>Text Expressions</td>
<td>26</td>
<td>11</td>
</tr>
<tr>
<td>Danger Statements</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Confidentiality Statements</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>N</td>
<td>236</td>
<td></td>
</tr>
</tbody>
</table>

According to results in Table 2, 56% of the students depicted the scientists using laboratory materials such as test tubes, microscopes in their drawings. The drawing of a student depicting a scientist in the working environment is given in Figure 6. 25% of the students draw a scientist with information symbols such as a book and a pen. One of these drawings is given in Figure 7.

Figure 6. A Drawing Depicting a Scientist with Research Symbols (S86)
It is seen that 45% of the students draw the scientist in their work environment with technological devices. The drawing of a student showing the scientist with technological tools is given in Figure 8. It was determined that 11% of the students included formulas, taxonomic classifications, expressions such as "I found it" in their drawings. A drawing of one of the students who included text and expressions in his drawing is given in Figure 9. In addition to Table 2, while 2% of the students included danger statements in their drawings, no confidentiality statements were found in their drawings. However, while two of the students did not include any element related to privacy in their drawings, they stated that scientists work in secret rooms in their explanations. A drawing of one of the students who mentioned danger statements is given in Figure 10.
When the answers given by the students were examined, it was found that the scientists drawn by 41% of students were between the ages of 25-50. While 28% of the students stated that the scientist they drew was in the 50-90 age range, 16% in the 0-25 age range, 15%.

**Table 3. Findings about the Age of the Scientist**

<table>
<thead>
<tr>
<th>Age Range</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-50</td>
<td>98</td>
<td>41</td>
</tr>
<tr>
<td>0-90</td>
<td>66</td>
<td>28</td>
</tr>
<tr>
<td>0-25</td>
<td>37</td>
<td>16</td>
</tr>
<tr>
<td>Invalid and Null Data</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>N</td>
<td>236</td>
<td></td>
</tr>
</tbody>
</table>

It is seen that the students mostly (46%) drew scientists in the laboratory. In addition, 41% of the students stated that the scientist they drew worked in closed environments such as a company, home, study room, and a secret room, 2% in open environments such as gardens and fields, 1% in space, 1% in hospitals. Sample drawings of students showing that the scientists work in different environments are given below:

**Table 4. Drawings about the Scientist’s Working Environment**

<table>
<thead>
<tr>
<th>Working Environment</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>108</td>
<td>46</td>
</tr>
<tr>
<td>Indoor Environment</td>
<td>97</td>
<td>41</td>
</tr>
<tr>
<td>Open Environment</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Space</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Hospital</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Unanswered</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>N</td>
<td>236</td>
<td></td>
</tr>
</tbody>
</table>
The results regarding the answers given to the question are given in Table 6. 35% of the participants depicted familiar scientists in their drawings. 18% of the students stated that they portray the scientist in their dream, and 5% of them stated that the scientist in their dreams were their close friends such as his father and brother, etc. Table 6, it was found that the students mostly illustrated Thomas Edison with a ratio of 19%. Then respectively 6% Einstein, 3% Nicholas Conte, 2% Grahambel, 1% Ibni Sina, 1% Al Cezeri, 1% drew Aziz Sancar.

Table 5. Answers to the "Who is the Person in Your Drawing?"

<table>
<thead>
<tr>
<th>Who is the person in your drawing?</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Known Scientist</td>
<td>82</td>
<td>35</td>
</tr>
<tr>
<td>My Dream Scientist</td>
<td>43</td>
<td>18</td>
</tr>
<tr>
<td>A Person in a closed environment</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Unanswered</td>
<td>99</td>
<td>42</td>
</tr>
<tr>
<td>N</td>
<td>236</td>
<td></td>
</tr>
</tbody>
</table>

Table 6. Drawing Rate of Known Scientists

<table>
<thead>
<tr>
<th>Widely Known Scientists</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edison</td>
<td>46</td>
<td>19</td>
</tr>
<tr>
<td>Einstein</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Nicholas Conte</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Grahambel</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>El Cezeri</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Ibni Sina</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Aziz Sancar</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Newton</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Hezarfen Ahmet Çelebi</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Mimar Sinan</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Elon Musk</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>N</td>
<td>236</td>
<td></td>
</tr>
</tbody>
</table>

When the answers given by the students were examined, it was determined that the students stated that they gained information about the scientists mostly from their teachers with a rate of 21%. In addition, 17% of them stated that they learned this kind of knowledge from the book.

Table 7. "Where Did You See the Scientist You Draw or Whom Did You Learn From?"

<table>
<thead>
<tr>
<th>From</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>From my teacher</td>
<td>50</td>
<td>21</td>
</tr>
<tr>
<td>From the book</td>
<td>41</td>
<td>17</td>
</tr>
<tr>
<td>From TV</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td>My dream</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>My close environment</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>From the Internet</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Unanswered</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>N</td>
<td>236</td>
<td></td>
</tr>
</tbody>
</table>
It was determined that the students stated that scientists invented technological devices such as cars, machines, robots, invented light bulbs and the scientist was engaged in experiments. In addition, the students stated that the scientist invented the pen, dealt with a rocket, studied with a microscope, prepared formulas such as immortality and invisibility.

Table 8. Scientist's Work

<table>
<thead>
<tr>
<th>Scientist's interest</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making invent</td>
<td>58</td>
<td>24</td>
</tr>
<tr>
<td>Invented the light bulb</td>
<td>49</td>
<td>21</td>
</tr>
<tr>
<td>Experimenting</td>
<td>47</td>
<td>20</td>
</tr>
<tr>
<td>Preparing potions</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Invented the pen</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Invented the phone</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Dealing with rocket</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Writes formulas</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Examining with a microscope</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Working in the field</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Mosques built buildings</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Works in hospital</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Shattered the atom</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Unanswered</td>
<td>45</td>
<td>19</td>
</tr>
</tbody>
</table>

N = 236

In order to determine the way scientists are included in the textbooks, primary school 4th grade Science books were provided to schools by the MONE in the 2017-2018 academic year. As a result of the examination, it was found that there are only two mentions about scientists only in the third science textbook. (Edison-Lewis Latimer). However, no mentions were found regarding the personal characteristics and life stories of these scientists. The information about the scientists given in the analyzed social studies textbooks is presented in the following

Table 9. The Information about the Scientists Mentioned in the Social Studies Textbooks

<table>
<thead>
<tr>
<th>Scientists</th>
<th>Physical appearance</th>
<th>Invention and design</th>
<th>Scientist characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johan Gutenberg</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>El Cezeri</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Edison</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Humphry Davy</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Carl Friedrich Benz</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Nicolas Conte</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Leonardo da Vinci</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Joseph and Etienne Montgolfier</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Wilbur and Orville Wright</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Yuri Alekseyevich Gagarin</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Lagari Hasan Çelebi</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Ferdinand von Zeppelin</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Igor Sikorsky</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Abbas Ibn Firmas</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Hazarfen Ahmet Çelebi</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Vecihi Hürkuş</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Nuri Demirag</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Steven Paul Jobs</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Albert Einstein</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Prof. Dr. Fuat Sezgin</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Charles Tripp and Eli Bovven</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Josephine Cochrane</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

It is emphasized that Johann Gutenberg is the pioneer of the printing house in the social studies textbook and his name and invention are included in the book (Figure 14). For the invention of
technological devices, the inventions of scientists such as El Cezeri, Thomas Alva Edison, Carl Friedrich, Nicholas Conte were included along with their pictures. An example excerpt from the book is presented in Figure 15.

Figure 14. Picture of First Printing Machine P.89

Figure 15. The Figure of Nicholas Conte, p.90

On page 91 of the social studies textbook, an infographic on the development of machine tools over time is given. In addition on page 91, a research assignment was given to the students for the roles of Abbas Ibn Firmas, Hezarfen Ahmet Çelebi, Vecihi Hürkuş, and Nuri Demirağ in this process. Under the text titled "Wonder of Design" on page 97, along with the statement, "Imagination and wonder are the basis of the invention" the related sayings of the inventors are included. The related part of the textbook is shown in Figure 16. And only one female scientist among all these scientists is included in the social studies textbook.

Figure 16. Sayings of Inventors P.97

It was found that the students mostly draw the scientist with glasses (21%) and 12% of the students drew a scientist wearing a lab coat, while 15% of them drew a scientist with complex facial hair, such as a beard and mustache. Similarly, in the social studies book, there are scientists with glasses in, a scientist in a lab coat, and a scientist with facial hair. Regarding the use of technological devices, it has been observed that in a large part of the unit, science is associated with the invention of technological tools. There is no clear information about danger, confidentiality statements, and working environments in the textbook. It is seen that most of the scientists included in the students' drawings are also included in the textbook. In addition, it was seen that the book included a visual of a
scientist, as is shown in Figure 17, drawn by students and possessing stereotypes frequently encountered in the media.

Figure 17. A Scientist Image in the Textbook on P.105

Teachers stated that information about scientists is given in the "Lighting and Sound Technologies from Past to Present" unit in the science lesson and in the "Science, Technology and Society" unit in the social studies lesson. Teachers stated that they emphasized that scientists generally conduct experiments tirelessly, are influenced by each other, and make inventions for the needs of people and they give information about scientists' discoveries rather than their external appearance, personal and social aspects in their lessons. It was also stated by teachers that the students asked their teachers in the lessons questions about how scientists are intelligent, why they work hard, how they perform their experiments, and whether it is easy or difficult to be a scientist. Several of the teachers used the term male scientist during the interview. In addition, a teacher stated that, in general, teachers do not have sufficient knowledge about scientists.

CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

As a result of this study, it was determined that scientists took place in the student drawings with the highest rate (21%) as people with glasses according to their external appearance. However, in the literature (Blagdanic, Kadijevic, and Kovacevic, 2019; Çakıcı, 2018; Doğan, 2015; Kathryn et al., 2016; Kaya et al., 2008; Mead & Metraux, 1957; Ruiz-Mallén and Escalas, 2012; Toğrol, 2000; Toğrol, 2013), it was found that the common image of a scientist in a lab coat is at a lower level (12%) in this study. 56% of the students drew the scientist as people working with research symbols and 45% as people working with technological tools. These high rates are in line with other studies in the literature (Camcı-Erdoğan, 2013; Emvalotis & Koutsianou, 2017; Türkmen, 2008; Yaçın, 2012). It was determined that the use of danger and confidentiality expressions in students' drawings has a very low percentage.

When the images of the scientist's working environment are examined; while 46% of the students stated that scientists work in the laboratory. Based on these results, according to the literature about the scientists working in the laboratory (Blagdanic, Kadijevic, and Kovacevic, 2019; Gheith and Aljaberi, 2019; Kaya, Doğan and Öcal, 2008; Korkmaz, Hünkär; Kavak, 2010; Toğrol, 2000), we can say that it still has stereotyped images. It is seen that the students are unaware of the examples of many scientists who worked for a long time in the monastery garden like Mendel, on the farm like Newton, and on a research ship like Darwin (Doğan et al., 2009). One of the important findings determined in this study is that the delusion of perceiving the scientist as a male, which has been dominant for the last 15-20 years, still continues (Buldu, 2006; Demirbaş, 2009; Gheith and Aljaberi, 2019; Nuhoğlu & Afacan, 2011; Oğuz- Ünver, 2010; Toğrol, 2000). In this study, some students even answered the question about the gender of the scientist as "of course male". In addition, it was determined that most of the students used the concept of "male scientist". One of the interesting findings obtained is that only one student portrayed a male and female scientist working together.

Regarding, the connections between the images that students have and the images in the 4th-grade science and social studies textbooks, it was seen that only Thomas Alva Edison's invention of
the light bulb was mentioned in the science book. It has been seen that there is no information about the characteristics or life stories of scientists. In the social studies textbook, the discoveries of 22 different scientists and the sayings of a few scientists are included. In addition, it was seen that only one female scientist in the social studies textbook. In this study, it was determined that 85% of the students drew a male scientist, while 13% drew a female scientist, and it was found that only one student painted a female scientist and a male scientist working together. This result shows that there are similarities between students’ images of scientists and scientists towards gender in textbooks. In addition, a visual of a scientist drawn by students in the social studies textbook and having stereotypes that are frequently encountered in the media was found (p.105) in the textbook. The similarity between this visual and the scientist images students have indicates that the textbook has an important role in creating the image of a scientist in students’ minds. The students generally stated that the scientist they drew invented technological tools and made experiments, and it was observed that the majority of the students stated that the scientist made the invention by being influenced by the invention of Nicholas Conte's pencil, Thomas Alva Edison's invention of the light bulb and the discoveries of other scientists. This result may be due to the fact that only the discoveries of scientists are included in the primary school 4th-grade textbooks. According to the results obtained in this study, it is seen that the stereotypical images still continue in parallel with other studies such as the scientist’s making experiments and inventions, drawing in middle age, with glasses, and as a man, working in closed environments such as laboratories.

If we compare to other studies, it can be said that the stereotypical images of the scientist as a lab coat, bald person with facial hair, and the use of danger and confidentiality expressions in the work environment have decreased. In addition, interviews were made with teachers to determine the source of the images students have. In the literature, the teacher; It is widely believed that one of the important factors in the formation of scientist images of students (Baday, 2019; Balkı, Çoban, & Aktaş, 2003; Buldu, 2006; Çakıcı, 2018; Türkmen, 2008). A teacher cannot be expected to explain a concept or subject that he or she is not familiar with. Or the teacher teaches as she/he knows (Akçay, 2014). In this study, the responses of students to “Who is the person you are drawing? From whom did you learn about this person?” showed that the teacher played an important role in the formation of the scientist’s image. Also, the fact that the students portray the scientist as the inventor of technological tools and the teachers stated that they generally talked about the discoveries of the scientists in their lessons shows that the students were impressed by their teachers in this respect as well.

Science fairs can be organized where students can come together with scientists in order to eliminate the stereotypical scientist perception of students and to show that science can be done in different settings and ages. Scientist figures used in resources affecting students' image of scientists should be arranged in a way that students develop positive images towards the scientist. As a country that aims to raise scientifically literate individuals; it is thought that it is very important to explain the importance of science history in terms of science teaching without neglecting it.

REFERENCES


Determining the Metaphor Perceptions of Generation Z Teacher Candidates for Handwriting and Keyboarding (Typing)

Zeynep Aydemir
Marmara University

Abstract

The aim of this study is to determine the metaphor perceptions of Generation Z teacher candidates towards handwriting and typing. Based on the metaphors obtained, elective courses related to handwriting may be included in undergraduate programs according to their point of view on handwriting. Many researches are carried out on the area created by the change that comes with the use of new technology. However, it is still necessary to ask new questions and seek answers. Therefore, in this study, according to the medium in which it is presented, whether in print or digital, how the nature of the content of the article changes according to the medium; what are the consequences of the superficialization of the content in terms of mental processes and what are the pre-service teachers' perspectives on handwriting. Study group of this research consists of 70 students among the Teacher Candidates in Istanbul in the fall semester of the 2020-2021 school year. For the data collection, a form with incomplete sentences such as “Handwriting is like... Because...” and “Keyboarding (typing) is like... Because...” was used to allow students to write down metaphors they attribute to “writing”. Generation Z Teacher Candidates produced metaphors in the category of handwriting respectively the life (27.1 %), thought and feelings (20%) attention and production (15.7 %), skill (15.7 %), functional (12.9 %) and share/transfer (8.6 %). Teacher Candidates produced metaphors in the category of keyboarding (typing) high level attention/ production (24.3%), superficiality/forgery (21.4%), easy/effortless (17.1%), thought and feelings (12.9%), sound (10%), skill (8.6%) and future (5.7%). Teacher Candidates should provide content and environments that will increase the longing for handwriting in their students to create awareness of writing and make them feel the need for writing. The determination of the meanings attributed by the Generation Z Teacher Candidates to traditional writing and typing with keys, and the perspective of Teacher Candidates on this subject were discussed.

Keywords: Writing, Handwriting, Keyboarding, Typing, Metaphor

DOI: 10.29329/ijpe.2022.426.12

Zeynep Aydemir, Research Assist Dr., Elementary Education, Marmara University, ORCID: 0000-0003-3002-1809

Email: zeynep.aydemir@marmara.edu.tr
INTRODUCTION

With the development of technology, educational environments have also entered the process of renewal. While preparing the programs in this renewal process, generation differences which are taken into consideration worldwide came to the fore. According to the Turkish Dictionary (2021), the group of people born in approximately the same years, experiencing similar problems under the conditions of the same age, sharing destinies and having similar duties is called a “generation”. A generation can be characterized as individuals who were born in a certain time period and who have similar behaviors and perceptions in social, cultural, political and economic aspects (TDK, 2021). The change or transformation that takes place depending on the time in the feelings, thoughts and behaviors of individuals has a significant role in the formation of different generation types. Historically, it is seen that the time periods that define the generations in researches are not standard. Population can be loosely categorized into four groups as defined by Strauss and Howe (1991): the Silent Generation (also known as the Matures—born between 1925 and 1942), the Baby Boomers (aka Boomers, born between 1943 and 1960), the 13th Generation (known most commonly as Generation X—born between 1961 and 1981), and the Millenial Generation (often referred to as GenerationY—those born between 1982 and 2000) (ex. Brosdahl & Carpenter, 2011). In addition to these generations, a Z Generation classification has been made for those born in 2000 and later at the beginning of the generations that we address with the millennium age, there is a mass called Generation Z whose number is substantially high. Individuals of the Generation Z have their own characteristics. Whether or not the education programs used by Generation Z individuals who are on the way to become teachers whose effects increase in the educational environment coincide with the traditional and their perspectives on traditional practices are a matter of curiosity and research. 33.7% of the world population, while 31% of Turkey's population is Generation Z (Kuran, 2019). In a study conducted with the generation Z, it was observed that this group used digital tools at a high rate to spend their free time and there were 10% of young people who said they would read books (Kuran, 2019). In the continuation of the research, it is stated that the Generation Z does not define itself in a single way, it is clearly pro-inclusion, less pro-conflict and more open to dialogue.

Actually, it is necessary to accept how the differences between generations can be made efficient and holistic by accepting that different generations have different wishes. In a study conducted jointly by UNIDAYS and Ad AGE in which 22.723 Generation Z students participated, seventy-seven percent of the participants preferred to read the books in print (as cited in Kuran, 2019). This situation actually shows that Generation Z is interested in and cared about traditional teaching methods. Instead of saying that Generation Z is indifferent or unsuccessful, or Generation Y before Z does not dominate the digital as much as Generation Z, it is necessary to talk about the effects of history and social events on generations, not the cyclicity of the generations as Mannheim says. While evaluating the generations, we should not ignore the socio-economic structure, culture and values of the geography they are in (Kuran, 2019).

Therefore, Generation Z should be given the opportunity to interpret, use and integrate traditional education programs with digital. Do Generation Z individuals like to use technology and reject many of the teachings brought by the traditionalist approach? Writing is one of the skills most affected by the developing technology. The main purpose of primary school teacher is to teach basal reading and writing. Reading and writing are considered as a whole and carried out together. This skill, which affects the success and daily life of the individual, is basically carried out on the basis of both technology and traditional approach. Based on this understanding, it is necessary to examine how the writing teaching process in our curriculum will change and the perspectives of Generation Z teacher candidates. Especially when Generation Z requests content related to writing, this generation mostly offers it written on a computer. Generation Z's preferences are also in this direction (Berk, 2009). In fact, the system and era we are in necessitate it to be like this.

Usually, digital texts are requested for many applications in daily life. In the past, when it comes to writing; writing with a pencil and pen, upright or cursive italic writing, calligraphy and writing in ink used to come to our minds. Nowadays, typing on computers, tablet computers and
mobile phones are generally understood (Bull, Thompon, Searson, Garofalo, Park, Young, & Lee, 2008). People prefer electronic devices for more functional writing with easy moves (Güneş, 2016). Because, effortless typing on keys of an electronic device have promptly been well accepted. On the other hand, these developments in the area of writing have always been discussed among the educators and how typing on electronic devices will affect our future and specifically the evolution of handwriting have been questioned.

Writing is consisted of the elements of the alphabet which are approximately 20 letters. Erik Havelock defined the alphabet as a technology boom and told it is the most revolutionary impact on human culture than any other inventions. He remarked the reason as this: Writing provided us protecting the things belong to the world without using our memories, keeping the things need to be remembered within the sentences and let the 26 letters contain whole world inside (as cited in Sanders, 1994). It is seen that writing had been affected from the inventions, sometimes rose and sometimes fell. McLuhan asserted that it was switched from verbal to writing, from writing to electronic/visual culture while each phase includes the previous one (as cited in Işık, 2016).

The written culture developed in line with the development of the bourgeoisie in West and accelerated with the invention of printing press and its spread. Writing and technology have always impacted each other in a positive way throughout the history. The use of writing was limited and the purposes and the functions of writing were different before the settled life. As the level of culture changed, the type of materials used in writing and the words which define them changed. The nomadic life did not need a detailed writing system so rulers and those around made the military and political activities written on big stone tablets in short and brief expressions. Thus, writing in both Mesopotamia and the Turkic states, and possibly in the other regions where it spread, was an upper-class activity far away from the masses, in the service of power with its political, religious and economic purpose and functions. Socrates’ statement also supports this: He says that those who are not knowledgeable should not write. Modern science owes its principles and methods largely to the foundation of written culture. In particular, basic scientific behaviors such as comparison, generalization, criticism, and classification have developed in parallel with the development of written culture and have created scientific thinking methods (Işık, 2016).

Güneş (2014) states that the act of writing is a mental, emotional and cognitive process and that mental design should be done at the first stage of the writing process. The fact that the writing contains certain stages and is considered important is an indication of the value given to writing in the history and the need for written culture. It is an important step in every culture and period for an individual to make himself/herself understood with writing, share his/her opinion and put it on paper.

Writing is an act of narration. Writing is the confrontation of the individual with his / her own emotions (Oral, 2003). On the other hand, writing is discovering life, trying to get to know the universe of other people (Eryaman, 2008; Gündüz, 2003). Writing is the expression of feelings, thoughts, wishes and events in our minds with various symbols in accordance with certain rules. In other words, it is the process of writing down the mentally structured information. In fact, the definitions made describe the text written on the printed paper. When it comes to traditional writing, the first thing that comes to mind is pen. When we look at the use of the pen concept in Turkish language, the department where the documents and writing works are seen in the state offices is specified as the pen room, and pen owner people are said to be able to write well. Again, when we look at the proverbs about the pen in the language, it is interpreted as writing “blood dripping from the pen” as painful and touching, writing so smooth and beautiful that no correction is required.

The content that comes to mind with the digitalization of the text is the rapid creation of the written content, copying, reproduction and modification, people coming together to create common texts, and presenting the content in a ready-made form (Yücel, 2020). It is suggested that with the technological developments, Generation Z students will leave the pencil completely and write all their homework with the keys (Güneş, 2014). It is argued that these developments will completely change the writing styles and habits of children and young people (Güneş, 2014). Some claim that
handwriting will disappear over time, teaching pen writing in schools will now be among the old methods and techniques, and that this education will fall behind cultural and social developments. Others state that in the future, technological developments will accelerate even more, all people will have to use a keyboard, and new skills and habits will emerge in the field of writing (Güneş, 2014).

It is also a matter of curiosity that the content of the benefits provided by traditional writing and how much the mental processes developed by individuals with writing instruction will be affected. Research in the field of writing shows that there are important differences between writing with pen and keys. These differences are addressed in terms of hand movements, attention, understanding and mental processes. In typing, the individual's writing movements and their perception of the direction of letters change. In addition, the eye both following the texts on the screen and trying to find the keys on the keyboard causes the attention to be divided into two. Situations such as the fingers constantly moving on the keyboard and the sound of the keys increase physical and mental fatigue. Despite these negativities, typing with keys has various benefits for individuals. Both hands are used together when typing on the keyboard. This situation activates both hemispheres of our brain and improves various skills such as high-level attention, creativity and productivity. In addition, its benefits such as fast writing, producing qualified and legible texts are also known (Güneş, 2016). In this case, it is necessary to develop content for the interaction between handwriting and typing.

The amount of writing has increased in the digital environment, but the quality of the content has decreased. However, with the digitalization of the article, the text came side by side with the visuals and started to be presented together. Sound recordings, videos, graphics and animations took main roles from writing. It should not be forgotten that every innovation has two ends, positive and negative effects. Considering that the Generation Z is intertwined with the keys, it is wondered what way they will follow in teaching handwriting and how they attribute meanings to traditional writing. This situation is spreading rapidly among students in schools. Writing with easy and effortless tools comes to the fore instead of writing that takes a long time to write, is difficult and troublesome and requires intense attention. Keys are gradually replacing the pen. The aim of this study was to determine the metaphor perceptions of Generation Z teacher candidates towards handwriting and typing. Based on the metaphors obtained, elective courses related to handwriting may be included in undergraduate programs according to their point of view on handwriting. Many researches are carried out on the area created by the change that comes with the use of new technology. However, it is still necessary to ask new questions and seek answers. Therefore, in this study, according to the medium in which it is presented, whether in print or digital, how the nature of the content of the article changes according to the medium; what are the consequences of the superficialization of the content in terms of mental processes and what are the pre-service teachers' perspectives on handwriting.

**METHOD**

**The design of the research**

This research is utilizing qualitative research methods and aiming to determine the perception of teacher candidates on handwriting and keyboarding (typing) through metaphors was carried out in accordance with phenomenological research design. Phenomenological research design aims to determine differences regarding perceptions and phenomena recognized by being handled in their natural environment from a realistic and holistic point of view but not known comprehensively (Yıldırım & Şimşek, 2008).

**Study Group**

Study group of this research consists of 70 students among the teacher candidates in Istanbul in the fall semester of the 2020-2021 school year.
Table 1. Personal information about the participants.

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>55</td>
<td>79</td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1 shows that out of 70 participants, 55 (79%) are female and 15 (21%) are male.

**Data collection and analysis**

Metaphors can be one of the most effective data collection methods in order to understand some issues in the inner world of individuals and to learn what they think about certain events, facts and people (Yıldırım & Şimşek, 2018). For this reason, in order to determine the metaphorical perceptions of teacher candidates about handwriting and keyboarding (typing), examples were given to them by explaining what metaphor is. For the data collection, a form with incomplete sentences such as “Handwriting is like... Because...” and “Keyboarding (typing) is like... Because...” was used to allow students to write down metaphors they attribute to “writing”.

Content analysis, one of the qualitative data analysis methods, was applied to the data obtained from the data collection tool. Content analysis is defined as a systematic, repeatable technique in which a text is summarized under smaller categories with codings based on certain rules (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2018). Analysis of the forms was carried out by two experts. Temporary lists were obtained by transferring all the metaphors produced by the teacher candidates into separate lists.

Thus, it was tried to determine which metaphor and how often the students expressed. Teacher candidates produced 43 metaphors about handwriting and these metaphors were collected under 6 categories. Teacher candidates produced a total of 48 metaphors about keyboarding (typing) and these metaphors were grouped under 4 categories. The data obtained in this study were first subjected to content analysis and categorized, then the number of opinions (f) and percentage (%) values reported for each category were calculated. In addition, the views that are thought to represent the categories in the most descriptive way are included in this article. The order in which quotations are given are arranged according to the frequency of similar views.

**Validity and reliability research design**

The codings made by the researchers were compared and the reliability formula (Reliability = [agreement / (agreement + disagreement)] * 100) developed by Miles and Huberman (1994) was applied for each of the forms separately. In the calculations, the level of harmony between coders was calculated as 92.4% in metaphors and 89.7% in metaphor categories.

**FINDINGS**

Findings of this research carried out to reveal the perception of teacher candidates regarding the “writing” concept by means of metaphors are given below under two titles: (1) Metaphors Formed by the Participants on the Handwriting and (2) Metaphors Formed by the Participants on the Keyboarding (Typing).

**Metaphors formed by the participants on the handwriting**

43 metaphors formed by the study group on the handwriting are given in Table 2 with their frequency distributions.
Table 2. Metaphors created for the handwriting of teacher candidates

<table>
<thead>
<tr>
<th>Metaphor Code</th>
<th>Metaphor</th>
<th>f</th>
<th>%</th>
<th>Metaphor Code</th>
<th>Metaphor</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Walk</td>
<td>8</td>
<td>11.4</td>
<td>23</td>
<td>Carry stone</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>2</td>
<td>Freedom</td>
<td>6</td>
<td>8.6</td>
<td>24</td>
<td>Knit</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>3</td>
<td>Being with beloved ones</td>
<td>4</td>
<td>5.7</td>
<td>25</td>
<td>Turn off an alarm clock</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>4</td>
<td>Pour out</td>
<td>4</td>
<td>5.7</td>
<td>26</td>
<td>Open a door</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>5</td>
<td>Water</td>
<td>3</td>
<td>4.3</td>
<td>27</td>
<td>Impossible</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>6</td>
<td>Drawing a picture</td>
<td>3</td>
<td>4.3</td>
<td>28</td>
<td>Moneybox</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>7</td>
<td>Sunrise</td>
<td>2</td>
<td>2.9</td>
<td>29</td>
<td>Sunset</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>8</td>
<td>Suitcase</td>
<td>2</td>
<td>2.9</td>
<td>30</td>
<td>Character</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>9</td>
<td>Trip</td>
<td>2</td>
<td>2.9</td>
<td>31</td>
<td>Rainbow</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>10</td>
<td>Flower</td>
<td>2</td>
<td>2.9</td>
<td>32</td>
<td>Treatment</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>11</td>
<td>Building a wall</td>
<td>2</td>
<td>2.9</td>
<td>33</td>
<td>Making a necklace</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>12</td>
<td>Breathe</td>
<td>1</td>
<td>1.4</td>
<td>34</td>
<td>Fishing line</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>13</td>
<td>Looking at the sky</td>
<td>1</td>
<td>1.4</td>
<td>35</td>
<td>Lay dominoes</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>14</td>
<td>Boomerang</td>
<td>1</td>
<td>1.4</td>
<td>36</td>
<td>Massage</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>15</td>
<td>Learning</td>
<td>1</td>
<td>1.4</td>
<td>37</td>
<td>Bungee Jumping</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>16</td>
<td>Swing</td>
<td>1</td>
<td>1.4</td>
<td>38</td>
<td>Cook</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>17</td>
<td>Backbone</td>
<td>1</td>
<td>1.4</td>
<td>39</td>
<td>Toy</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>18</td>
<td>Cleaning</td>
<td>1</td>
<td>1.4</td>
<td>40</td>
<td>Embroider</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>19</td>
<td>Ride a bicycle</td>
<td>1</td>
<td>1.4</td>
<td>41</td>
<td>Treatment plant</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>20</td>
<td>Background music</td>
<td>1</td>
<td>1.4</td>
<td>41</td>
<td>Power</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>21</td>
<td>Reborn</td>
<td>1</td>
<td>1.4</td>
<td>43</td>
<td>Pick fruit</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>22</td>
<td>Seed</td>
<td>1</td>
<td>1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 2 is considered, it can be said that the study group developed 43 metaphors in total for the “handwriting”. 11.4% (f=8) of the participants said the “handwriting” is like “walk”. This metaphor is followed by “freedom” (f=6) with 8.6%, “being with beloved ones”, “pour out” have a frequency level of 5.7% (f=4). However, of these metaphors, “building wall” (2.9%), “backbone” (1.4%), “knit” (1.4%), and “massage” (1.4%) are very remarkable.

Metaphor Categories Developed by the Participants on the Handwriting

Metaphors developed by teacher candidates participants were collected under 6 categories (themes) among themselves. Metaphor categories are given in Table 3.

Table 3. Metaphorical perception categories for the handwriting of teacher candidates.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Metaphors</th>
<th>Metaphor Code</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life</td>
<td>Water (3), sunrise (2), flower (2), breathe (1), backbone (1), pick fruit (1), carry stone (1), massage (1), toy (1), back</td>
<td>15</td>
<td>19</td>
<td>27.1</td>
</tr>
<tr>
<td></td>
<td>ground music (1), sunset (1), rainbow (1), looking at the sky (1), boomer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ang (1), bungee jumping (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughts and</td>
<td>Freedom (6), pour out (4), impossible (1), character (1), power (1),</td>
<td>6</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>Feelings</td>
<td>reborn (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention/</td>
<td>Drawing a picture (3), building a wall (2), seed (1), making a necklace</td>
<td>8</td>
<td>11</td>
<td>15.7</td>
</tr>
<tr>
<td>Production</td>
<td>(1), knit (1), cook (1), embroidery (1), lay dominoes (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skill</td>
<td>Walk (8), swing (1), ride a bicycle (1), learning (1)</td>
<td>4</td>
<td>11</td>
<td>15.7</td>
</tr>
<tr>
<td>Functional</td>
<td>Cleaning (1), suitcase (2), turn off an alarm clock (1), moneybox (1),</td>
<td>8</td>
<td>9</td>
<td>12.9</td>
</tr>
<tr>
<td></td>
<td>treatment (1), fishing line (1), treatment plant (1), open a door (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share/Transfer</td>
<td>Being with beloved ones (4), trip (2)</td>
<td>2</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>43</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

When Table 3 is considered, it can be said that 43 metaphors developed by the participants were collected under 6 main categories. These are all related to the handwriting as follows: (1) Life, (2) Thoughts and feelings, (3) Attention/Production, (4) Skill, (5) Functional, and (6) Share/Transfer.
When Table 3 is considered, handwriting as a Life is the category which was mostly developed with 15 metaphors (57.4%). Sample expressions by the participants and the distribution of metaphors from each category field are as follows (F=female, M=male).

**Category 1:** The category of “Life” consists of 15 metaphors developed by 19 participants. The following metaphors are considered under this category when their common attributes and simile aspects are taken into consideration. Sample expressions by the participants were selected according to their frequency level and the ones with high frequency in this category are given below:

- “Writing is like watching a water flowing from a waterfall for me. Just as we feel a sense of relief while watching the water flowing from the waterfall, I also relax while writing” (M1).
- “For me, writing is like the evening sun hitting the calm sea (sunset)” (M42).
- “Writing is like the blooming of colorful flowers in spring for me. I like to write, I definitely have my notepad and pen in my bag with me everywhere” (M34).
- “Writing is like breathing for me. Because it allows us to breathe comfortably by putting our inner troubles on paper” (F8).
- “Writing is like picking fruit from a tree for me. It is a bit difficult, but the more you write, the more you want to write” (F38).
- “Writing is like looking at the sky for me. This shows that writing represents comfort, peace and happiness for me” (F60).
- “Writing is like a boomerang for me. Because no matter how well I try to write, I always go back to the beginning and find myself writing badly again” (F5).

**Category 2:** The category of “Thoughts and Feelings” consists of six metaphors developed by 14 participants. In this category, the metaphor samples with high frequency are given below.

- “Writing is a path to freedom for me. All of our inner troubles, suppressed emotions, reckonings find their way after writing them down and attain calmness. We express ourselves to ourselves, and after a while we don’t think about the rest” (F38).
- “For me, writing is like pouring my heart out to a friend who cares about me in a time when I’m very troubled and stressful. Writing relaxes me and reminds me of the feeling that I have fulfilled my responsibilities” (M33).
- “I like to write. It was said that people’s spelling expresses the characters. That’s why I have always worked to make my writing nice and organized since I was little” (F43).
- “Writing is like having power for me. Because I always used writing when I felt I was weak in my life and it made me feel strong” (F70).
- “Writing is like reborning for me. Because learning to write is the meaning of things that were meaningless to me until that day” (M27).

**Category 3:** The category of “Attention/Production” consists of eight metaphors developed by 11 participants. In this category, the metaphor samples with high frequency are given below.

- “Writing is like drawing a picture. There is a perception that writing is an art for me” (F18).
- “Writing is like building a wall with bricks to me. Because I think that I express myself most accurately only by writing” (F9).
“Writing is like hoping a seed for me. There is a perception that writing here carries hopes for me” (F29).

“Writing is like making a necklace by sequencing pearls for me” (F46).

“Writing is like knitting for me. Because writing is a job that requires patience for me” (F35).

“Writing is like cooking for me. Even if the same ingredients are present in the meal, the taste of the food will be different because the hand taste of the person making it is different. The important thing here is to be able to cook with the appropriate method and skillfully. Even if the subject is the same in the articles written in the same way, when the style of the writer is different, we get different tastes while reading the written article, the taste will be different. If the thing that adds flavor to the food is salt and spices, I think it is the verbal arts used that also add flavor to the writing. Food nourishes the body and written products nourish the soul and knowledge” (F62).

“Writing is like embroidering a fabric for me. It gives me the same feeling in the paragraphs formed at the end of the writing, such as the beautiful, pleasant image formed after the embroidery is finished” (F66).

Category 4: The category of “Skill” consists of four metaphors developed by 11 participants. This metaphor can be exemplified as follows:

“Writing is like walking for me. At first I enjoy it, I keep on my way. When I get tired, it feels like an unbearable ordeal; I would like to continue with another vehicle. There is a perception that the post is tiring for me” (F12).

“Writing for me is like riding a bike by the sea. Because it is fun and enjoyable” (F24).

“Writing is one of the most effective learning methods for me. Because as I write I think and learn” (M3).

Category 5: The category of “Functional” consists of eight metaphors developed by 9 participants. This metaphor can be exemplified as follows:

“Writing is like cleaning up for me. So I write the complicated thoughts in my head I feel like I have put my life in order more when I spend it” (F4).

“Writing is for me; it’s like a very heavy suitcase that I have to carry. There is a perception here that writing is an obligation for my life, but I have a hard time writing any article with my hand” (M7).

“Writing is like turning off the alarm clock for me. Because I list all the tasks and tasks I have to do, and write and plan them daily weekly. As I do that job, I cross the list. Here for me there is a perception of telling the order” (M30).

“Writing is like putting money into a moneybox for me. There is a perception here that writing is easy for me and provides accumulation” (F41).

“Writing is like the last minute dose of adrenaline given to a dying patient for me” (M45).

“Writing is like a treatment plant for me. Purification means making it more acceptable for a particular end use “(M69).

“Writing is fishing line that enables me to fish. So it is the tool for my purpose. How difficult is it to reach the toolless goal, so for me writing is a need, indispensable” (F48).
“Writing is like a row of dominoes for me. There is a perception here that writing is an occupation that requires attention for me” (F49).

Category 6: The category of “Share/Transfer” consists of two metaphors developed by 6 participants. This metaphor can be exemplified as follows:

“Writing for me is like spending a day with my loved ones. Because as much as I enjoy the time I spend with my loved ones, I enjoy the same when I put that day on paper” (F20).

“For me, writing is like taking an intercity bus ride or even taking a break there in the winter. You don’t want to continue, you want to go down, but you can’t stop anywhere, you can’t get off. You have to finish that post. It is tiring” (F21).

Metaphors Formed by the Participants on the Keyboarding (Typing)

48 metaphors formed by the study group on the keyboarding (typing) are given in Table 4 with their frequency distributions.

Table 4. Metaphors created for the keyboarding (typing) of teacher candidates.

<table>
<thead>
<tr>
<th>Metaphor Code</th>
<th>Metaphor</th>
<th>f</th>
<th>%</th>
<th>Metaphor Code</th>
<th>Metaphor</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Play a piano</td>
<td>4</td>
<td>8.3</td>
<td>25</td>
<td>Prefer</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>2</td>
<td>Soulless person</td>
<td>3</td>
<td>6.3</td>
<td>26</td>
<td>Watching Tv</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>3</td>
<td>Write with a soulless pen</td>
<td>3</td>
<td>6.3</td>
<td>27</td>
<td>Heating with natural gas</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>4</td>
<td>Driving fast</td>
<td>3</td>
<td>6.3</td>
<td>28</td>
<td>A free bird</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>5</td>
<td>Blow up balloons</td>
<td>3</td>
<td>6.3</td>
<td>29</td>
<td>Hug</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>6</td>
<td>Write thoughtlessly</td>
<td>3</td>
<td>6.3</td>
<td>30</td>
<td>Playing tetris</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>7</td>
<td>Run</td>
<td>3</td>
<td>6.3</td>
<td>31</td>
<td>Downhill cycling</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>8</td>
<td>Finger exercise</td>
<td>3</td>
<td>6.3</td>
<td>32</td>
<td>Sitting at the computer</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>9</td>
<td>Artificial flower</td>
<td>2</td>
<td>4.2</td>
<td>33</td>
<td>Eat fruit</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>10</td>
<td>Ride the escalator</td>
<td>2</td>
<td>4.2</td>
<td>34</td>
<td>Digging wells with a needle</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>11</td>
<td>Robot</td>
<td>2</td>
<td>4.2</td>
<td>35</td>
<td>Unsalted meal</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>12</td>
<td>Rain sound</td>
<td>2</td>
<td>4.2</td>
<td>36</td>
<td>Extracting rice stone</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>16</td>
<td>Teleport</td>
<td>2</td>
<td>4.2</td>
<td>37</td>
<td>Preparing homework</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>14</td>
<td>Lego</td>
<td>1</td>
<td>2.1</td>
<td>38</td>
<td>Make a presentation</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>15</td>
<td>Make the food s/he knows</td>
<td>1</td>
<td>2.1</td>
<td>39</td>
<td>Using ready-made cover</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>13</td>
<td>Play snowballs without gloves</td>
<td>1</td>
<td>2.1</td>
<td>40</td>
<td>Unnoticed change of season</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>17</td>
<td>Machine sounds</td>
<td>1</td>
<td>2.1</td>
<td>41</td>
<td>Untie a knot</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>18</td>
<td>Pull up curtain</td>
<td>1</td>
<td>2.1</td>
<td>42</td>
<td>Journey without route</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>19</td>
<td>Draw a picture</td>
<td>1</td>
<td>2.1</td>
<td>43</td>
<td>Be a acrobat</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>20</td>
<td>Ski</td>
<td>1</td>
<td>2.1</td>
<td>44</td>
<td>Play an instrument</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>21</td>
<td>Making pasta</td>
<td>1</td>
<td>2.1</td>
<td>45</td>
<td>Magnet</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>22</td>
<td>Composing songs with notes</td>
<td>1</td>
<td>2.1</td>
<td>46</td>
<td>Solving the first grade question</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>23</td>
<td>Do puzzles</td>
<td>1</td>
<td>2.1</td>
<td>47</td>
<td>Relaxation</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>24</td>
<td>Stress ball</td>
<td>1</td>
<td>2.1</td>
<td>48</td>
<td>Do an easy job</td>
<td>1</td>
<td>2.1</td>
</tr>
</tbody>
</table>

When Table 4 is considered, it can be said that the study group developed 48 metaphors in total for the “keyboarding (typing)”. 8.3 % (f=4) of the participants said the “handwriting” is like “play a piano”. This metaphor is followed by “soulless person”, “write with a soulless pen”, “driving fast” have a frequency level of 6.3 % (f=3). However, of these metaphors, “finger exercise” (6.3%), “teleport” (4.2%), “unsalted meal” (2.1%), and “do puzzles” (2.1%) are remarkable.
Table 5. Metaphorical perception categories for the keyboarding (typing) of teacher candidates.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Metaphors</th>
<th>Metaphor</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High level attention/production</td>
<td>Driving fast (3), lego (1), do puzzles (1), make e presentation (1), untie a knot (1), preparing homework (1), extracting rice stone (1), be a acrobat (1), downhill cycling (1), playing tetriss (1), draw a picture (1), digging wells with a needle (1), composing songs with notes (1), prefer (1), ski (1)</td>
<td>15</td>
<td>17</td>
<td>24.3</td>
</tr>
<tr>
<td>Superficiality/forgery</td>
<td>Souless person (3), write with a soulless pen (3), write thoughtlessly (3), artificial flower (2), robot (2) unnoticed change of season (1), Unsalted meal (1)</td>
<td>7</td>
<td>15</td>
<td>21.4</td>
</tr>
<tr>
<td>Easy/ Effortless</td>
<td>Ride the escalator (2), watching tv (1), make the food s/he knows (1), making pasta (1), do an easy job (1), solving the first grade question (1), using ready-made cover (1), heating with natural gas (1), play snowballs without gloves (1), pull up curtain (1), eat fruit (1)</td>
<td>11</td>
<td>12</td>
<td>17.1</td>
</tr>
<tr>
<td>Thoughts and feelings</td>
<td>Play a piano (4), stress ball (1), relaxation (1), journey without route (1), hug (1), a free bird (1)</td>
<td>6</td>
<td>9</td>
<td>12.9</td>
</tr>
<tr>
<td>Sound</td>
<td>Blow up balloons (3), rain sound (2), machine sounds (1), play a instrument (1)</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Skill</td>
<td>Run (3), finger exercise (3)</td>
<td>2</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>Future</td>
<td>Teleport (2), magnet (1), sitting at the computer (1)</td>
<td>3</td>
<td>4</td>
<td>5.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>48</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

When Table 4 is considered, it can be said that the study group developed 48 metaphors in total for the “keyboarding (typing)”. 8.3 % (f=4) of the participants said the “handwriting” is like “play a piano”. This metaphor is followed by “soulless person”, “write with a soulless pen”, “driving fast” have a frequency level of 6.3 % (f=3). However, of these metaphors, “finger exercise” (6.3%), “teleport” (4.2%), “unsalted meal” (2.1%), and “do puzzles” (2.1%) are remarkable.

When Table 5 is considered, it can be said that 48 metaphors developed by the participants were collected under 7 main categories. These are all related to the Keyboarding (typing) as follows: (1) High level attention/production, (2) Superficiality/forgery, (3) Thoughts and feelings, (4) Sound, (5) Skill, and (6) Future. When Table 5 is considered, Keyboarding (typing) as a High level attention/production is the category which was developed the most with 15 metaphors (24.3%). Sample expressions by the participants and the distribution of metaphors from each category field are as follows:

**Category 1:** The category of “High level attention/ production” consists of 15 metaphors developed by 17 participants. The following metaphors are considered under this category when their common attributes and simile aspects are taken into consideration. Sample expressions by the participants were selected according to their frequency level and the ones with high frequency in this category are given below:

“Keyboarding (typing) is like driving fast on the highway for me. Because I write fast” (M32).

“Keyboarding (typing) is like playing with lego for me. Because a creation of the human mind is created from pieces with lego. I also create what’s in my mind when typing, especially when typing” (F9).

“Keyboarding (typing) is like puzzle for me. Because I try to put together the mixed letters I see in front of me in order to write down the thoughts that cross my mind” (F62).

“Keyboarding (typing) is like untying knots for me. Sometimes difficult and sometimes easy” (F49).

“It’s like removing white stone from rice. Here, there is a perception that keyboarding (typing) is as difficult for me as searching for individual letters and choosing a white stone from brass” (M41).
“Keyboarding (typing) is like being a acrobat for me. Because the harder it is to keep keyboarding (typing), the more difficult it is to walk on the rope, the more difficult it is for me. Keyboarding (typing) is very troublesome for me” (F37).

Category 2: The category of “Superficiality/forgery” consists of seven metaphors developed by 15 participants. In this category, the metaphor samples with high frequency are given below.

“Keyboarding (typing) is like writing with a soulless pen for me. Because I don't think it conveys my feelings or emotions” (F8).

“Keyboarding (typing) is like an artificial flower for me. Writing with pencil and paper; while real is a flower that I can smell and touch, typing with a button is artificial” (M36).

“Keyboarding (typing) is like looking like a robot for me. Handwriting has the characteristics of the writer, it is unique to that person. However, typing with keys means typing in the same style for everyone. So typing with keys seems fake and easy to me” (F59).

“Keyboarding (typing) is like a soulless, numb person for me. Because your pen and paper; is to write without knowing the warmth, feelings and feelings” (M3).

Category 3: The category of “Easy/Effortless” consists of 11 metaphors developed by 12 participants. In this category, the metaphor samples with high frequency are given below.

“Keyboarding (typing) is like riding an escalator for me. Because typing provides me speed and convenience” (F16).

“Keyboarding (typing) is like making a food I know the recipe very well for me. Because I can easily do a food that I know very well without difficulty, and I can easily write with the keys” (F11).

“Keyboarding (typing) is like watching a game on TV for me. When I write the text with a pen, I feel as if I am watching that game in a live stadium. But I also enjoy typing with keys even if I don't feel the same excitement” (M1).

“Keyboarding (typing) is like pasta made in a student house for me. Because it is the most practical meal that can be made at that time, but it does not replace the meal our mother cooked at home. So is typing with keys. It is practical, but it can not substitute for the writing we write with paper and pen, it can not give that pleasure” (F22).

“Keyboarding (typing) is for me; it is similar to the new bride removing the dowry lace and laying off ready-made embroideries. Because, in my opinion, dowry lace is like handwriting written with care and effort, while ready-made textile fabrics are like a simple and practical writing written with keys” (F56).

“Keyboarding (typing) is like removing curtains from a cornice for me. Because using my ten fingers on the keyboard, I can type quickly without resting and I don't get tired. While removing the curtain from the cornice, we can pull the whole curtain down with a single move” (F14).

“Typing with keys is like heating with natural gas for me. Because it is not as hot and traditional as the stove culture, but it warms, it is practical” (F35).

Category 4: The category of “Thoughts and Feelings” consists of six metaphors developed by 9 participants. In this category, the metaphor samples with high frequency are given below.

“Keyboarding (typing) is like a stress ball for me. Because every time I press a new key, I relieve my stress and the faster I press it, the more relaxed and lighter I am” (F63).
“Keyboarding (typing) is like a relief for me, a kind of expressions of getting off my load. Because the things I think, wishes, problems, etc. I have written many cases and I can find the opportunity to examine and research the solution steps in depth. In this case, it makes me happy and relaxed” (F66).

“Keyboarding (typing) means almost hugging a person I miss. It means communicating with my loved ones. Because today's communication and communication tools are now provided through messaging applications” (F30).

“Keyboarding (typing) is like playing the piano and expressing yourself with notes, expressing your feelings and thoughts. Because while writing without getting tired; the meaningful and legible words, sentences and texts that emerge with the movement of the fingers gives me a feeling of success and relaxation” (F7).

Category 5: The category of “Sound” consists of four metaphors developed by 7 participants. In this category, the metaphor samples with high frequency are given below.

“Keyboarding (typing) is like popping balloons in a bubble wrap bag for me. Because the sound of typing on the keyboard motivates me to continue typing. I try to think fast and write fast. The addiction that occurs when I pop the balloons in the packaging bag also happens when typing on the keyboard (F61).

“Keyboarding (typing) is like falling raindrops for me, because I feel freedom and peace when I hear the sound of the rain, and when I hear the sound of the keyboard when I click the keyboard keys. I feel that I radiate the freedom and peace that is now missing in the world” (M26).

“Keyboarding (typing) is like the product they produce at the end of the very loud machines in the factory for me. Both have the same feel to me. The sound of the keys satisfies me and makes me feel that I can really do something, especially when preparing homework” (F13).

Category 6: The category of “Skill” consists of two metaphors developed by 6 participants. In this category, the metaphor samples with high frequency are given below.

“Keyboarding (typing) is like running for me instead of walking. Because being able to convey my thoughts faster causes me to be more active and productive” (F5).

“Keyboarding (typing) is like playing finger wrestling for me. Because our fingers are always active and fast. It's fun to write this way” (F24).

Category 5: The category of “Future” consists of three metaphors developed by 4 participants. In this category, the metaphor samples with high frequency are given below.

“Keyboarding (typing) is like teleporting my thoughts to me. Because, thanks to the keys, I can reach my thoughts wherever I want in a very short time. What I want to say, I transfer it from my mind to my fingertips to the keys” (F12).

“Keyboarding (typing) is like magnet for me. Cause there is always, only the objects sticking to the magnet are changing” (M23).

DISCUSSION

Writing directly contributes to the development of many skills as it is intertwined with mental processes as well as language skills. Therefore, teacher candidates perspectives in developing writing skills will shape the future of writing education. Generation Z teacher candidates produced metaphors in the category of handwriting, respectively the life (27.1 %), thought and feelings (20%), attention
and production (15.7 %), skill (15.7 %), functional (12.9 %) and share/transfer (8.6 %). Teacher candidates produced metaphors in the category of keyboarding (typing) high level attention/production (24.3 %), superficiality/forgery (21.4 %), easy/effortless (17.1 %), thought and feelings (12.9 %), sound (10 %), skill (8.6 %) and future (5.7 %).

The metaphors, which are in the life and thoughts and feelings categories, which have the most percentile for handwriting, contain many elements that people use, do not give up and need in daily life. Writing, unlike language, is lifeless because it does not need sound. It is interesting that the metaphors attributed to the writing, which is seen as a lifeless skill, are about life. In fact, this situation shows the importance of inanimate writing and that it is an activity intertwined with thought. The most life metaphors related to writing were produced. It indicates the existence of the text that we will use in the lifelong learning process. Writing can be defined as explaining the opinions, ideas and feelings of those who have the power of thinking, as well as their observations, experiences, and experiences in accordance with the rules of the language (Göçer, 2010). As it can be understood from the definition, in fact, writing has an important effect in expressing daily life, expressing life, experiencing and sharing experiences. The transfer of knowledge and culture is provided by writing. People want to write and describe this feeling that they live and experience as what they want to be. According to people, life erases what is not told over time. The act of writing is carried out to express all these experiences and accumulations, to protect and hide all kinds of feelings and thoughts that take place in life indirectly or directly. In this context, it is similar to the person who overlaps with the identity of the author and tries to hide his writings over time. Writing, starting from a thought, makes the word permanent and transfers it to the other side, it is permanent and fixed (Özdemir, 2020). Therefore, it coincides with the actions that exist in life. The writing has added interaction to this balance it has created with people, and has offered various concepts, feelings and thoughts to people's use. We write because we see writing as a way of life and because we see writing as equivalent to living (Karasevda, 2010). “Writing is like looking at the sky for me,” and “Writing is like breathing for me.” statements also support this. The findings of the research coincide with the findings of Tiryaki and Demir (2016). The act of writing has two dimensions, and the first of these dimensions is the quality part that includes holding the pencil, where the basic skills of writing are gained, and the operational and psychomotor skills of transferring letters, syllables, words and sentences to paper. It is stated that the second dimension is the content part that includes transferring the thoughts to the paper in line with the basic skills gained in the first dimension (Akyol, 2005). In this respect, it can be said that writing is a skill beyond mechanical operations. In order to save the writing skill from the mechanical processing process, it is necessary to ensure that it is intertwined with life, which is the most produced metaphor category. Writing studies in classroom environment should be associated with life. The enjoyable aspects of writing should be shown to students with activities such as diary writing and memoirs. It is not true to think that students' interest in writing skill will increase by just writing an essay.

One of the categories in which metaphors such as freedom, pouring out etc. produced for handwriting take place is thought and feelings. On the other hand, it is among the metaphors produced for keyboarding (typing). Sanders (2014) emphasizes that literacy is more than just writing something, learning the alphabet system, or learning letters; it is a process in which the individual shares his or her experiences and enables personality formation. Writing directly contributes to the student's thinking, understanding, communication and emotion skills. In addition to the writing processes such as generating ideas, planning and reviewing that require attention at the same time, it is stated that the way an individual manages cognitive resources is critical for successful writing (Christensen & Jones, 2000; Saada-Robert, 1999). Students express their feelings by writing. While a person is writing or thinking about something, he / she is decontextualized, abstracted; regardless of the situation, defines, describes and classifies (Sanders, 1994). Comparative studies of handwriting and keyboarding (typing) also imply that computer use does not only affect specific handwriting skills, but also similarly affects fine motor skills and thus general characteristics of human behavior (Medwell & Wray, 2008; Sülzenbrück, Hegele, Rinkenauer & Heuer, 2011). Handwriting is a complex perceptual–motor skill encompassing a blend of visual–motor coordination abilities, motor planning, cognitive, and perceptual skills, as well as tactile and kinesthetic sensitivities. In a clinical study conducted by James Pennebaker in 1986, it was concluded that the act of writing had positive effects on the psychology of
the person, the selected subjects were asked to write about their most distressing and difficult experiences, and as a result of the study, interesting information was obtained: For this reason, the person chose to write for himself as the type of action. It is seen that he reflects the feelings that have accumulated in him from the moment on, with the method of writing, and confesses the issues that he is afraid to tell even to himself, through writing (as cited in Özdemir, 2020). Sait Faik Abasryanck's "I would be crazy if I didn't write." expresses the psychological therapeutic feature of the act of writing words. Regarding this, the author stated in İnci Aral (2009) that writing is a therapy. In the studies conducted with teacher candidates (Kayabaşı & Yılmaz Karadağ, 2019; Tok, Rachim & Kuş, 2014), some of the teacher candidates stated that they experienced emotional relief while writing, while others stated that they had difficulty expressing themselves. It is among the important results of the research that teacher candidates do not have writing habits, they do not like writing, but they find writing important because it is permanent, provides emotional relief and offers personal freedom (Kayabaşı & Yılmaz Karadağ, 2019). In this case, it supports the findings of the research.

One of the common metaphors in both fields is attention and production. Attention and production is an important common category in both handwriting and keyboarding (typing). One of the important processes of writing skill on this subject is to produce a product. Le Guin (2018) states that writing requires first of all an art and therefore production. Keyboarding (typing) it easier to produce text and increases the productivity and creativity of individuals. Especially simple operations, corrections, producing quality text, drawing, adding images and sharing are easier. Digital writing can be edited and updated more easily than writing with pen and paper. According to Taipale (2014), digital writing increases textual productivity, especially as it allows editing quickly and efficiently (as cited in Susar Kırmızı, Kapıkıran, & Akkaya, 2021). Teacher candidates also stated their reasons for choosing to keyboarding (typing) in a way consistent with the findings of the research, such as saving time, being economical, easy sharing opportunity, use of visuals, legible writing, reduction of spelling and punctuation problems, page layout and archiving (Tüzel & Tok, 2013). The findings of the research overlap with the scale items developed to evaluate the attitudes of prospective teachers towards the digital writing process (Susar Kırmızı et al. 2021). The scale items in the convenience sub-dimension are as follows: It is easier to share what is written in the digital environment than when it is written on paper; I can easily correct the mistake due to the features of the program in digital manuscripts; I think more fluently when writing in digital environment; Writing digitally increases my self-confidence. The metaphors produced with the results of Ustabulut's (2021) research are consistent. Participants in the research stated that digital writing provides convenience and they can easily perform all kinds of writing operations in the digital environment. In addition, they stated that digital writing motivates them, writing in digital environment increases their self-confidence, gives them great pleasure, and they feel a great lack of themselves when they cannot write digitally. While individuals inevitably write something in front of the screen, they have to deal with processes that require attention.

On the other hand, when the metaphors that the teacher candidates upload for keyboarding (typing) are examined, one of the categories that rank second is superficiality/forgery. In handwriting, a relationship is established between the shape, image and spelling of each letter in our minds. Everyone has their own characteristic writing. In fact, character analyzes are made from the writing styles written by people on this subject. The text is coded by the writer; the meaning is built by the author within the text; expression passes through the linguistic ability of the author (Yücel, 2020). In Keyboarding (typing), a relationship is established between the shape of each letter we create in our mind and its place on the keyboard. This relationship is actually superficial and temporary. It is obvious that individuals who keyboarding (typing) want to explain the subject briefly and concisely while expressing themselves. There is a content in which the traces of daily life are seen more and do not require much mental effort. Writing with pen and handwriting, development of student's writing skills, personality, importance given to writing, clean and meticulous writing, etc. gives clues about. This situation helps the teacher to recognize the handwriting of the students and to check the homework from the handwriting. However, it is difficult to make such checks in electronic writing and to determine by whom the writing was produced. Yücel (2020) mentioned the dilution and superficialization process of content as one of the resonances that writing experiences with
digitalization, which is consistent with the finding. He states that the reason for this is that the users show interest in easier content and the creation of easily consumed content. One of the metaphors obtained in the research findings is that keyboarding (typing) is a process that does not require easy/effortless. In the digital environment, the message is instant. The article is produced and circulated instantly. Its strength has weakened in terms of content, and it will end with another news, message. Readers see many content at the same time and deal with instant, daily articles. During the day, they have to give an emotional response as well as a cognitive response. This situation actually brings up the artificial behaviors of Generation Z in the background. "Better" now means "faster" in digital culture. Aragón-Mendizábal, Delgado-Casas, Navarro-Guzmán, Menacho-Jiménez and Romero-Oliva (2016) stated in their study with 251 university students that those who took notes with computers were faster than handwriting and therefore wrote more sentences. Digital writing is used in the preparation of homework, diaries, online uses, browsing the internet, e-mail, written messages, blogs, software creation and website design. The texts may contain multimedia elements such as images and sounds from time to time. Digital writing has become the social norm of recent years. Digital writing refers to new ways of communicating in the new age. Reading and writing proficiency may change with digital technologies, but this does not mean that writing on paper is excluded, taking into account the benefits of handwriting (Armstrong, 2014; Grapes, Parsons, & Towne, 2014; Vincent, 2014). It can be said that with the increase in the use of technology in recent years, there has been an explosion of digital writing. The rapidly spreading computer networks and the use of technology will continue to become widespread day by day. Accordingly, there is a period of rapid change in how and with which tools writing is written. It is an undeniable fact that the importance of digital writing has increased. Written language used in digital environments can also lead to many spelling mistakes caused by the use of digital communication tools (such as typing fast, making keyboard mistakes), and these wrong expressions can cause a negative perception on the readers. Studies have shown that texts with spelling mistakes negatively affect the reader's perception of reliability (Cox, Cox, & Cox, 2017; Fogg et al., 2001; Horn, Nelson, & Brannick, 2004; Vignovic & Thompson, 2010) associate spelling errors in texts that readers encounter mostly with fast typing or the indifference of the text writer. Texts in which the author is evaluated as reckless are accepted as texts with low reliability (Cox et al., 2017; Vignovic & Thompson, 2010). Fogg et al. (2001), in their research examining the factors affecting the reliability of web sites, concluded that even a single letter error can negatively affect the reader's perception of that web page.

Among the expressions under the superficiality category, “Keyboarding (typing) is like writing with a soulless pen for me. Because I don't think it conveys my feelings and emotions.” “Keyboarding (typing) is like an artificial flower for me. Writing with pencil and paper; while real is a flower that I can smell and touch, typing with a button is artificial.” It is seen that such discourses are also expressed in researches. It is possible to see that this close relationship between individuals' personality traits and word preferences continues in the production and sharing of content in digital environments. According to Kottke (2007), when readers encounter spelling mistakes, they think that it is more of a technical error (such as keyboard errors, pressing the wrong key), and when they encounter spelling mistakes, they attribute this to the author's lack of knowledge on the subject. (as cited in Erdem & Ünlü, 2018). In addition, the perception of digital texts, which are error-free or in accordance with the spelling rules of the language, on the reader also emerges as an important determinant in terms of increasing the effect of expression styles in digital environments (Erdem & Ünlü, 2018). For this reason, it is possible to pay more attention to the use of written language in the virtual world and, if there are technological updates in the acquisitions related to reading, it can be added to the acquisitions related to writing. For example: “It pays attention to punctuation marks in digital writing.” or “Examines the correct spelling of words in digital writing”.

Among the advantages of keyboarding (typing), while there are studies for individuals to develop skills such as high-level attention, creativity and productivity, and the metaphors obtained in the research have also been seen in this direction, “Why is pen writing / handwriting still taught in schools? What would be lost if teaching to write with direct keys is done in schools? ”The question comes to mind. Today, there is a strong emphasis on improving students' pencil writing skills in many countries. Because writing skills developed at an early age make a great contribution to students' self-
expression, learning, and developing their language, mental, emotional and social skills. The findings of the study are in this direction. Recent research once again reveals that writing with a pencil is important for students' language, mental development and creativity. On the other hand, researches reveal that students who first learn to read and write with the keyboard have reading problems, and their reading and writing skills are not sufficiently developed. For this reason, priority is given to writing with pencil in primary school (Güneş, 2016). As the use of technology has expanded, the focus on time spent on handwriting instruction has dramatically decreased. Research suggests that the process of writing by hand is highly complex and allows students to gain cognitive and literacy skills that cannot be duplicated when using a keyboard (Alonso, 2015; Stevenson & Just, 2012). Handwriting practice wires the brain for reading and writing success and contributes to reading fluency (Berninger, 2013). The contribution of handwriting to thinking skills is undeniable, but as Bull et al. (2008) said, it is emphasized that the experiences of young people in communication technologies should be evaluated by educators and course contents should be prepared in accordance with pedagogical principles based on these experiences. In a study conducted by Lenhart, Arafeh and Smith (2008), it is said that the majority of young people prefer to write cursive. In the findings of the research, it was revealed that they knew and used the importance of handwriting. Lenhart et. al. (2008) revealed that despite widespread technology ownership and use among young people, the vast majority of young people generally prefer handwriting. It has been revealed that students who prefer to write on the computer prefer to write on the computer because of faster and smoother writing. On the other hand, students who prefer handwriting stated that they prefer handwriting more because of organizing thoughts and revealing creativity more easily when writing in handwriting.

The first thing that comes to mind when it comes to writing is handwriting. But today's children especially the Generation Z Children have become writing with keys without taking the pen in their hands, and many of them have trouble holding a pencil. As can be seen, defenders of the pen argue that writing will be difficult without technological tools, internet and electricity, people will not be able to express themselves and written communication will be compromised (Mogey, Sarab, Haywood, Van Heyningen, Dewhurst, Hounsell & Neilson, 2008). On the other hand, those who defend the keyboard claim that the future of writing depends on technological tools, it cannot be considered separately, writing with pen is an old tradition and has no place in the future. On the other hand, educators emphasize that students should be taught to write with a pen first then switch to the keys and focus on developing both skills (Freeman, Mackinnon & Miller, 2005; Güneş, 2016).

Teacher candidates should provide content and environments that will increase the longing for handwriting in their students to create awareness of writing and make them feel the need for writing. The determination of the meanings attributed by the Generation Z teacher candidates to traditional writing and typing with keys, and the perspective of teacher candidates on this subject were discussed. Children can not learn handwriting from digital tools but Teacher Candidates should be a model by sharing their writing experiences with students. Primary responsibility for teaching students to have writing skills and to awaken their interest and enthusiasm for writing lies with classroom teachers and Turkish teachers. According to Morgan (2010), determining the writing habits and preferences of teacher candidates will contribute to the development of writing education more effectively and to produce solutions to the problems experienced in this regard.

According to Güneş (2014), children's prior knowledge should be qualified and functional and their writing activities should be effective and permanent. For this reason, children should be given print awareness training from an early age. Teacher candidates' thoughts about writing are important in order to raise their students' awareness of writing and to train them in writing awareness. Not limiting the education of writing to the studies in schools, making the student gain the habit of writing outside of the school and integrating keyboarding (typing) with handwriting may arouse pleasure and desire in terms of writing.
CONCLUSION

Within the scope of the study, the meanings attributed to handwriting by Generation Z teacher candidates are significant. With the psychomotor aspect of writing, that is, with the use of the hands, a record is created, but this record leaves a trace and is permanent. Since writing is a psychomotor skill, it represents touching and touching signs. Generation Z teacher candidates do not want to leave a mark in their lives, to make their lives meaningful and to give up on traditional writing. It was emphasized that handwriting is a process beyond writing skills and especially its contribution to personality development. The metaphors produced highlight the longing for handwriting and show that handwriting is different from keyboarding (typing). Writing acquisition can only be met by writing acquisition. Handwriting teaching should not be decreased, but rather increased, the studies done on its current and future situation. It is important for teachers to be aware of the significant of writing skills.

REFERENCES


Classroom Teachers' Expectations from Pre-School Education on the Process of Preparation for Literacy: An Exploratory Sequential Design Study

Mehmet Soyuçok
Bursa Uludag University

Yakup Balantekin
Bursa Uludag University

Abstract

In this study, it was aimed to reveal classroom teachers' expectations from pre-school education within the context of literacy teaching and to develop a measurement tool depending on these expectations. The study was conducted with 682 classroom teachers in accordance with the exploratory sequential design, one of the mixed method designs. The expectations of classroom teachers within the context of literacy teaching were first determined by qualitative data collection methods, then, the validity and reliability analyses of the draft measurement tool created with these data were performed and the measurement tool was developed, and finally, this measurement tool was applied on a different sample and the expectations of classroom teachers from preschool education within the context of literacy were determined. According to the qualitative data, classroom teachers' expectations were evaluated under the themes of listening, speaking, reading, writing and school adjustment. In the scale development process, the reliability was ensured by Cronbach's Alpha coefficient, the content validity was ensured by expert opinions, and the construct validity was ensured by exploratory and confirmatory factor analysis. As a result of the analyses, a valid and reliable scale consisting of 24 items and three factors as listening-speaking, reading-writing and school adjustment was developed. It was recommended that classroom teachers should evaluate their expectations from pre-school education with pre-school teachers during their professional working periods.

Keywords: Pre-School Education; Preparation for Literacy; School Adjustment; Exploratory Sequential Design

DOI: 10.29329/ijpe.2022.426.13

---

1 Mehmet Soyuçok, Research Assist Dr., Department of Primary Education, Bursa Uludag University, ORCID: 0000-0001-8388-2130
Correspondence: msoyucok@uludag.edu.tr

2 Yakup Balantekin, Assist. Prof. Dr., Department of Primary Education, Uludag University, ORCID: 0000-0002-8674-3598
Classroom Teachers' Expectations from Pre-School Education on the Process of Preparation for Literacy: An Exploratory Sequential Design Study

In today's world, it has become almost impossible for an individual to lead a normal life without literacy skills (Taylor & McAtee, 2003). In fact, it can be said that the studies based on the concept of lifelong literacy (Hanemann, 2015; Hanemann & McKay, 2015; Raseroka, 2003; Sligo et al., 2007), as well as the idea that considers literacy as a basic communication tool (Benavot, 2015), confirm it. Early literacy skills constitute the basis of literacy, which is of such vital importance, and the reading and writing that children will learn later (Justice et al., 2002).

Early literacy skills develop before formal education in which reading becomes the primary academic focus (Missall et al., 2007). In this period which corresponds to the pre-school period, the is widely believed that the rich stimuli that children encounter are effective in the acquisition of literacy skills (Şenol & Akyol, 2021). There are approaches that evaluate the early literacy skills of toddlers with this idea (Weigel et al., 2017). Despite the attempts to perform these evaluations before formal pre-school education, the view that pre-school period is the most appropriate time to promote the development of literacy and to screen for and respond to the first signs of reading difficulties has increasingly gained more acceptance (Missall et al., 2007).

It is of critical importance to develop children's basic literacy skills before they start primary school. Children's home literacy environments (Evans et al., 2000) and classroom practices in pre-school education (Jackson et al., 2006) have effects on the language and literacy development that includes these skills. While the home literacy environment can be shaped according to the families' economic opportunities (Templeton, 1986), pre-school education is carried out within the scope of a formal program (Niikko & Havu-Nuutinen, 2009). From this aspect, pre-school education can be described as a conscious and programmed initiative that prepares children for primary school (Lim-Ratnam, 2013). In this respect, it can be said that pre-school education is the last opportunity for disadvantaged children with insufficient home literacy environment to start primary school by being ready (Barnett, 1992).

Early childhood education constitutes the basis not only for individual development but also for social development (Temple & Reynolds, 2007; Yoshikawa et al., 2013). Despite this critical importance, there are different approaches to pre-school education between countries. While these differences can sometimes be caused by the policies of the governments, and the level of social awareness may sometimes lead to these differences. For instance, the schooling rate is not sufficient because pre-school education is not compulsory in Turkey. In the 2018-2019 academic year, the schooling rate between 4-5 years of age in pre-school education was announced as 57.9% and it was planned to switch to compulsory education for the 5-year-old group (Official Gazette, 2019). In some countries, although pre-school education is not compulsory, the rate of participation in education can be very high during this period. For instance, the schooling rate of children aged 3-5 years in Hong Kong is 94.7% (Chan, 2010).

The quality of education received by children is as important as their access to pre-school education for children to start primary school ready (Sandstrom, 2012). The abovementioned quality problem may also lead to other problems. For instance, although pre-school education is carried out with a certain program, teachers may neglect some aspects of this program in practice (Niikko & Havu-Nuutinen, 2009). This negligence may cause children with incomplete and incorrect learning in pre-school education and their classroom teachers to have various difficulties in the literacy learning process (Koçyiğit, 2009). Such cases reveal the importance of increasing communication and cooperation between pre-school teachers and classroom teachers in order to increase the quality of pre-school education. Indeed, the lack of communication and cooperation between teachers may lead to serious problems such as making it difficult and delaying the adaptation of children to school (Chan, 2012). In cases where preschool and primary school teachers are in cooperation, teachers will be able to communicate their mutual expectations to each other and it will be possible to increase the quality of pre-school education (Niikko & Havu-Nuutinen, 2009).
There are essential differences between pre-school and primary school education, for instance, pre-school education is planned and mostly carried out with play and child-centered methods, however, the education in which courses and subjects are of first priority is at the center of primary school education. Therefore, pre-school teachers consider curriculum as a framework and can be flexible in practice according to the needs of the children, however, primary school first grade teachers can feel the pressure of the curriculum (Einarsdottir, 2006). The fact that teachers know their students in every aspect and carry out the first literacy teaching process in accordance with the needs of the students in the first grade is important to achieve success. Since pre-school education is not compulsory in Turkey, the differences in school readiness levels of students who receive and do not receive pre-school education in the transition to primary school are among the significant challenges faced by classroom teachers in the educational environment. This problem may be reduced by making pre-school education compulsory. However, when the literature is reviewed, problems such as the presence of children who do not start primary school ready due to incomplete and erroneous learning despite receiving pre-school education (Koçyiğit, 2009), the fact that literacy teaching is carried out although it is not included in the preschool education program (Taşkin et al., 2015), and some preschool teachers' mistakes in literacy preparation activities (Yapıcı, & Ulu, 2010) may also cause difficulties for primary school teachers in the literacy teaching process. For these reasons, in many studies aimed to determine the expectations of classroom teachers from pre-school education (Bozgün & Uluçınar-Sağır, 2018; Pekdoğan, 2017; Tantekin-Erden & Altun, 2014), classroom teachers' expectations from pre-school education within the context of preparation for literacy were mentioned.

The starting point of this study is that although children receive pre-school education, they face various problems in the literacy learning process due to incomplete or erroneous learning during this period. Children should start primary school by reaching a certain level in terms of listening and speaking skills, which are among the four basic language skills, so that literacy education can be carried out in a qualified manner. However, while pre-school teachers focus more on writing skills as a preparation for literacy, they may include more limited studies on improving phonological awareness, visual perception, vocabulary, listening and speaking skills (Erdoğan et al., 2013). In this study, listening, speaking, reading and writing skills, which are the competencies that children need to acquire in the pre-school period so that they can start school ready to learn to read and write, were discussed as a separate category. Furthermore, in addition to these four basic language skills for the literacy teaching process, children's level of school adjustment was also discussed as a separate category. The expectations of classroom teachers from pre-school education in terms of the process of preparation for literacy were examined under these five categories. In brief, unlike other studies, the aim of this study was to determine classroom teachers' expectations from pre-school education on the process of preparation for literacy, and to develop a valid and reliable scale accordingly with the contributions of the program and the relevant literature along with these expectations. With the scale developed, it is considered that policy makers and school directorates will be enabled to quickly determine the expectations of classroom teachers from pre-school education within the context of the studies on the process of preparation for literacy and that that preschool teachers will be able to organize their teaching activities in accordance with these expectations.

METHOD

Research Model

This study was conducted in accordance with the exploratory sequential design, one of the mixed method designs. In this design, the research problem is first addressed by collecting and analyzing qualitative data, and then, the results obtained are converted into a scale and become a data collection tool. After this quantitative stage, the data collection tool developed with a third quantitative stage is tested (Creswell, 2015). In the study process, firstly, the qualitative data were first collected and analyzed, and the expectations of classroom teachers from pre-school education within the context of literacy teaching were revealed. Along with these expectations, an item pool was created by using the literature (Akçay, 2016; Bozgün & Uluçınar-Sağır, 2018; Chan, 2012; Chan, 2010; Deveci & Kavak, 2020; Güneyli & Bağkent-Özyel, 2016; Pekdoğan, 2017; Tantekin-Erden & Altun, 2014;
Taşkın et al., 2014; Taşkın et al., 2015) and Ministry of National Education [MoNE, (2013)] Preschool Education Program and MoNE (2019) Turkish Language Curriculum. Then, the validity and reliability studies of the measurement tool were performed. As the third stage of the exploratory sequential design, classroom teachers' expectations from pre-school education within the context of literacy teaching were revealed through the scale, the validity and reliability study of which was performed. The other parts of the method applied in this study are presented under the titles of qualitative and quantitative parts in accordance with the exploratory sequential design.

**Qualitative Part**

**Study Group**

The qualitative data group consisted of the teachers who completed the essay form on the subject and the teachers who participated in the focus group interview. These teachers were selected by the maximum diversity sampling method. In this type of sampling, it is aimed to ensure the diversity of those related to the aim of the study (Yıldırım & Şimşek, 2008). The essay form was applied to 30 teachers working in primary schools located in regions where families from upper, middle and lower socioeconomic levels lived. Focus group interviews were conducted with 22 teachers working in primary schools located in regions where families from upper, middle and lower socioeconomic levels lived, provided that they were different from the schools where the teachers in the first group worked. Teachers' gender, professional seniority, literacy teaching with the sound-based literacy teaching method, and class level distributions were taken into consideration in the selection of teachers. The schools were determined by interviewing the directorate of national education. The characteristics of the classroom teachers who participated in the qualitative part of the study are presented in Table 1.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Professional Seniority</th>
<th>Number teaching 1st graders</th>
<th>Applying the Sound Based Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>Male</td>
<td>1-5 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>30</td>
<td>22</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>58%</td>
<td>42%</td>
<td>2%</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade level taught this</th>
<th>Undergraduate Program Graduated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2.</td>
</tr>
<tr>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>44%</td>
<td>17%</td>
</tr>
</tbody>
</table>

When Table 1 was examined, it was observed that while 35% (f=18) of the 52 participating teachers had 11-15 years of professional seniority, 48% (f=25) of them taught first graders for 5 times or more, 44% (f=23) of them taught first graders this year, and all of the teachers (f=52) apply the sound-based literacy teaching method.

**Data Collection Tools**

**Expectation Questionnaire for the Process of Preparation for Literacy.** The questionnaire developed by the researchers consists of two parts. The first part includes four open-ended questions such as "What are your expectations from pre-school education within the context of listening skills for the process of preparation for literacy?". The second part includes those related to literacy teaching such as “Applies verbal instructions.” and "Does painting and drawing works” among the 1st grade achievements included in the MoNE (2019) Turkish Course Curriculum. Classroom teachers in the
research group completed the questionnaire by marking the achievements that they thought should be prepared in the pre-school period in accordance with the needs of primary school first grade students. A pilot study was conducted with four classroom teachers before applying the questionnaire. No suggestion was offered by the teachers in the pilot application and the questionnaire was applied in its original form.

**Focus Group Interview Form for the Process of Preparation for Literacy.** The interview form developed by the researchers includes five open-ended questions such as "What are your expectations from pre-school education within the context of reading skills to support the literacy learning process of students?". Probe sub-questions were prepared to get detailed information about each question. For instance, sub-questions such as “What are your expectations about phonological awareness” and “What are your expectations about the ability to read visual materials?” were included for the question stated above. A pilot study was conducted with six classroom teachers, and it was indicated by the teachers that there should be a question about "readiness for school" and "recognition and writing of numbers". All of these suggestions of the teachers were added to the interview form and the form was finalized.

**Data Collection and Analysis**

Due to the pandemic, the days when the classroom teachers were at school were learned from school directorates and school visits were carried out on those days. The teachers were informed about the research subject and they were given one week to complete the essay form. After the teachers completed the forms, they submitted them to the school directorates and the questionnaires were taken from the school directorates. A total of 40 teachers were reached, but 30 teachers returned. The answers to the open-ended questions of the questionnaire were analyzed using the descriptive analysis method, and the part of the questionnaire related to the 1st grade achievements was analyzed by creating frequency. The data collected from the teachers were used both in the creation of the scale item pool and in the development of the interview form.

The focus group interview was conducted by one of the researchers via the internet in order to avoid any confusion. The interview was conducted in three sessions with one school each from the regions where low, middle and high socioeconomic level students lived, and teachers working in these schools. The interviews were conducted with a total of 22 volunteer teachers, including 7 teachers from schools in low and middle socioeconomic regions and 8 teachers from the school in the high socioeconomic region. The interviews lasted for 56 minutes 15 seconds, 62 minutes 25 seconds, and 71 minutes 42 seconds, respectively. The video-recorded interviews were analyzed separately by both researchers through descriptive analysis method, and the common codings were included in the scope of qualitative data. Miles and Huberman (2015) indicated that the consistency between the coding of both researchers should be at least 80% and that this value can be calculated with the formula “Consensus/(Consensus+Dissensus)x100”. In accordance with this formula, the intercoder reliability was calculated as 86.1% according to the 31/(31+5)x100 operation, and this value was considered sufficient in terms of consistency.

**Quantitative Part**

**Study Group**

No sampling method was used for exploratory factor analysis (EFA), and the draft scale was delivered to the classroom teachers working in 11 of 17 districts in Bursa province through the district national education directorates and school directorates on the internet. Necessary reminders were given to teachers by reaching the district directors of national education, branch managers in charge of primary schools, and some school principals many times so that the scale would be completed by the teachers. 375 teachers completed the draft scale, and information about these teachers is presented in Table 2.
Table 2. Characteristics of the study group from which EFA Data were Collected

<table>
<thead>
<tr>
<th>Gender</th>
<th>Professional Seniority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-5 years</td>
</tr>
<tr>
<td>Female</td>
<td>274</td>
</tr>
<tr>
<td>Male</td>
<td>73.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number teaching 1st graders</th>
<th>Applying the Sound-Based Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Did not teach</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade level taught this</th>
<th>Undergraduate Program Graduated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classroom teaching</td>
</tr>
<tr>
<td>2</td>
<td>Other</td>
</tr>
</tbody>
</table>

When Table 2 was examined, it was observed that while 73.1% (f=274) of the 375 participating teachers were female, 24.8% of the teachers (f=93) had 21-25 years of professional seniority, and 50.7% of the teachers (f=190) taught first graders for 5 times or more.

It is a more accurate approach to perform CFA on a different dataset instead of trying to confirm the structures formed as a result of factor analysis with the same data set through confirmatory factor analysis (CFA) (Gürbüz, 2019). Therefore, the data for CFA were collected from classroom teachers working in six districts of Bursa province, except for the group in which factor analysis was performed. The teachers were reached with the method used in the draft form and the information about these teachers is presented in Table 3.

Table 3. Characteristics of the study group from which CFA Data were Collected

<table>
<thead>
<tr>
<th>Gender</th>
<th>Professional Seniority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-5 years</td>
</tr>
<tr>
<td>Female</td>
<td>179</td>
</tr>
<tr>
<td>Male</td>
<td>70.2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number teaching 1st graders</th>
<th>Applying the Sound-Based Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Did not teach</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade level taught this</th>
<th>Undergraduate Program Graduated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classroom teaching</td>
</tr>
<tr>
<td>2</td>
<td>Other</td>
</tr>
</tbody>
</table>

When Table 3 was examined, it was observed that while 70.2% (f=179) of the 255 participating teachers were female, 22.7% of the teachers (f=58) had 16-20 years of professional seniority, and 51.8% of the teachers (f=132) taught first graders for 5 times or more.

Data collection tool

The draft items of the Expectations from Preschool Education (EPE) were created by using the qualitative data, literature and the relevant curricula. The items were prepared under the themes of listening, speaking, reading, writing and school adjustment. A total of 40 items, consisting of 9 items for listening skill, 7 items for speaking skill, 3 items for reading skill, 8 items for writing skill and 13 items for school adjustment, were created from the qualitative data. The final draft scale was formed
as 52 items by adding 12 items (1 item for listening, 4 items for speaking, 3 items for reading and 4 items for school adjustment) from the literature and the relevant curriculum to these items. Expert opinions were obtained from a total of 12 people, one of whom was a faculty member working in the field, three of whom were preschool teachers and eight of whom were classroom teachers, in order to ensure content validity. The experts evaluated the items in the scale one by one and marked one of the "appropriate, should be added to the scale with corrections, removed" options given next to the items for each item. Experts were asked about which corrections should be made in the items requested to be corrected. The content validity ratio (CVR) was calculated for each item with help of the formula proposed by Lawshe (1975) to calculate the content validity of the scale items along with the data collected from the experts. \[ \text{KGO} = \left[ \frac{N_u - (N/2)}{N/2} \right] \]

While Ayre and Scally (2014) indicated that at least 10 experts should express positive opinions about the item when 12 expert opinions were obtained, and that the CVR value should be at least 0.667, Lawshe (1975) indicated that the CVR value should be at least 0.56 when 12 expert opinions were obtained. The CVR values of the items were 0.667 for three items (items 11, 14, 49), and the other items had values between 0.834 and 1. Based on these results, no item was removed from the scale as a result of expert opinions. The language validity of the items was examined by a Turkish language expert before conducting a pilot application with draft scale. The language expert made suggestions for a total of seven items and all suggestions were fulfilled. The fact that it was asked to write "Sense of self-confidence for students" instead of "Students' sense of self-confidence…", and "The similarities between the images and the…” instead of “The similarity between the images and …” can be given as examples of the corrections suggested. After the relevant corrections, a pilot application was conducted after 17 classroom teachers completed the scale, and no correction suggestions were received from the teachers.

**Data Collection and Analysis**

The draft scale was delivered to the teachers through the school directorates and the teachers completed the scale with a computer, tablet or mobile phone. EFA was performed with the data collected, and principal components analysis and varimax rotation method were used. Then, Cronbach's Alpha reliability values were calculated on the basis of factors and for the whole scale. The final scale formed as a result of content validity, factor analysis and reliability analysis was applied to a different group, and CFA was performed.

**FINDINGS**

The findings of the study are presented in three parts in accordance with the exploratory sequential design. While the qualitative data of the study are presented in the first part, the validity and reliability information of the scale developed is presented in the second part, and the data on the expectations of classroom teachers from pre-school education are presented in the final section.

**Qualitative Findings of the Study**

The qualitative data of the study are presented in an order in accordance with the themes of "listening, speaking, reading, writing, school adjustment " and the findings on the listening theme are presented in Table 4.
Table 4. Qualitative data on listening skill

<table>
<thead>
<tr>
<th>Thematic Codes</th>
<th>Teacher Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities that will enable students to listen in accordance with the rules</td>
<td>T2/T3/T6/T9/T15/T19/T22/ T23/T29 /T35/T40/T42</td>
<td>12</td>
</tr>
<tr>
<td>Listening activities with the help of audio materials without technology support</td>
<td>T32/T41/T43/T44/ T48/T49/ T52</td>
<td>7</td>
</tr>
<tr>
<td>Activities that improve attention during listening</td>
<td>T41/T42/T43/ T46/T49/T50/T52</td>
<td>7</td>
</tr>
<tr>
<td>Activities to improve students' ability to apply verbal instructions</td>
<td>T1/T11/T23/T40/T42/ T51/T52</td>
<td>7</td>
</tr>
<tr>
<td>Listening activities supported by technological tools</td>
<td>T33/T45/T48/T52</td>
<td>4</td>
</tr>
<tr>
<td>Activities in which students are listened</td>
<td>T31/T32</td>
<td>2</td>
</tr>
<tr>
<td>Developing students' listening skills with games</td>
<td>T46</td>
<td>1</td>
</tr>
<tr>
<td>Ensuring that students make eye contact while listening</td>
<td>T46</td>
<td>1</td>
</tr>
<tr>
<td>Supporting students' appropriate listening behaviors with reinforcers</td>
<td>T46</td>
<td>1</td>
</tr>
</tbody>
</table>

When Table 4 was examined, it was observed that while 12 of the participating teachers indicated that students' listening skills should be developed in accordance with the rules, 7 of them indicated that there was a need for listening activities with audio materials without technology support. While T1 said that "more importance can be attached to their ability to act according to directions.,” T32 said "I think that watching audio-visual videos and games, and listening and watching cartoons will not benefit children in terms of listening. (...) I think the most important thing here is to be able to listen while talking to each other.

The findings on the speaking theme of the study are presented in Table 5.

Table 5. Qualitative data on speaking skill

<table>
<thead>
<tr>
<th>Thematic Codes</th>
<th>Teacher Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities that encourage students to speak</td>
<td>T3/T9/T15/T16/T19/T20/T24/ T33/ T40/T41/ T42/ T44/T45/T52</td>
<td>13</td>
</tr>
<tr>
<td>Supporting students’ appropriate speaking behaviors with reinforcers</td>
<td>T46/ T52</td>
<td>2</td>
</tr>
<tr>
<td>Approaches to develop students' self-confidence for speaking</td>
<td>T28/T52</td>
<td>2</td>
</tr>
<tr>
<td>Increasing the participation of introverted students in speaking activities</td>
<td>T33/T47</td>
<td>2</td>
</tr>
<tr>
<td>Activities that support students to say the words fully and correctly in speech</td>
<td>T33/T50</td>
<td>2</td>
</tr>
<tr>
<td>Studies on the elimination of speech disorders caused by speech organs</td>
<td>T45/T50</td>
<td>2</td>
</tr>
<tr>
<td>Activities to gain speaking rules through games</td>
<td>T40</td>
<td>1</td>
</tr>
</tbody>
</table>

When Table 5 was examined, while 13 of the participating teachers indicated that there was a need for activities that encourage students to speak, 2 of them stated that students’ speaking in accordance with the rules should be supported with reinforcers. T28 stated that "Emphasis should be placed on activities that improve children’s self-confidence and speaking skills."

The findings on the reading theme of the study are presented in Table 6.

Table 6. Qualitative data on reading skill

<table>
<thead>
<tr>
<th>Thematic Codes</th>
<th>Teacher Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies to feel, recognize and distinguish the sounds</td>
<td>T4/T8/T14/T24/T28/T34/T41/T50</td>
<td>9</td>
</tr>
<tr>
<td>Activities to improve students' visual reading skills</td>
<td>T2/T4/T15/T19/T41/T46</td>
<td>6</td>
</tr>
<tr>
<td>Preventing mislearning related to sounds and letters</td>
<td>T8/T46/T49/T50</td>
<td>4</td>
</tr>
</tbody>
</table>

When Table 6 was examined, while 9 of the participating teachers indicated that students needed to feel, recognize and distinguish sounds, 6 of them indicated that there was a need for activities to improve their visual reading skills. T4 stated that "Sound awareness studies should be..."
included in the preschool period. In particular, sound recognition activities should be carried out effectively”.

The findings on the writing theme of the study are presented in Table 7.

### Table 7. Qualitative data on writing skill

<table>
<thead>
<tr>
<th>Thematic Codes</th>
<th>Teacher Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approaches and activities that enable students to hold the pencil correctly</td>
<td>T4/T8/T11/T12/T13/T16/T17/T23/T24/T25/T29/T30/T31/T33/T35/T42/T46/T49/T51/T52</td>
<td>20</td>
</tr>
<tr>
<td>Exercises to develop students' finger muscles</td>
<td>T1/T3/T6/T10/T13/T18/T19/T21/T22/T24/T26/T27/T28/T30/T31/T33/T34/T40/T46/T50</td>
<td>20</td>
</tr>
<tr>
<td>Performing painting and drawing works that will not tire the students</td>
<td>T3/T5/T6/T8/T11/T12/T13/T24/T39/T40/T41</td>
<td>16</td>
</tr>
<tr>
<td>Line works suitable for the lengths and slopes of the lines forming the letters</td>
<td>T19/T25/T28/T30/T34/T35/T40/T46</td>
<td>8</td>
</tr>
<tr>
<td>Studies on writing awareness</td>
<td>T4/T15/T16/T20/T23/T25/T32</td>
<td>7</td>
</tr>
<tr>
<td>Line works in areas with certain borders</td>
<td>T35/T42</td>
<td>2</td>
</tr>
<tr>
<td>Preferring pencils that do not tire the child</td>
<td>T45</td>
<td>1</td>
</tr>
<tr>
<td>Line works in accordance with the instructions on squared paper</td>
<td>T47</td>
<td>1</td>
</tr>
</tbody>
</table>

When Table 7 was examined, while 20 of the participating teachers indicated that the students needed to hold the pencil correctly, 18 of them indicated that it was necessary to perform activities to develop students' finger muscles. T17 stated that “I want them to make sure they hold the pen correctly. The boy went to kindergarten. He held the pencil wrong. Unfortunately, we cannot provide the correct holding.”.

The findings on the school adjustment theme of the study are presented in Table 8.

### Table 8. Qualitative data on school adjustment

<table>
<thead>
<tr>
<th>Thematic Codes</th>
<th>Teacher Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities for teaching school/classroom rules</td>
<td>T5/T6/T13/T16/T17/T18/T19/T20/T21/T22/T30/T31</td>
<td>12</td>
</tr>
<tr>
<td>Regular parent education on topics such as the aims of pre-school education</td>
<td>T31/T33/T35/T41/T42/T43/T46/T48/T49/T52</td>
<td>10</td>
</tr>
<tr>
<td>Students' acquisition of self-care skills (toilet training, tying laces,</td>
<td>T10/T32/T33/T34/T35/T39/T40/T42/T43</td>
<td>9</td>
</tr>
<tr>
<td>unbuttoning trousers, feeding, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approaches and activities to develop a sense of responsibility in students</td>
<td>T30/T41/T42/T43/T48/T49/T52</td>
<td>7</td>
</tr>
<tr>
<td>Approaches and activities that improve students' self-confidence</td>
<td>T5/T33/T39/T40/T41/T43</td>
<td>6</td>
</tr>
<tr>
<td>Studies for students to act independently from parents</td>
<td>T23/T31/T35/T42/T43</td>
<td>5</td>
</tr>
<tr>
<td>Activities for teaching basic concepts (right, left, beginning, end, etc.)</td>
<td>T32/T33/T34</td>
<td>3</td>
</tr>
<tr>
<td>Activities for the child to experience the sense of achievement</td>
<td>T39/T40</td>
<td>2</td>
</tr>
<tr>
<td>Students' introduction with literacy materials Activities in which students'</td>
<td>T32</td>
<td>1</td>
</tr>
<tr>
<td>visual interpretations are written by adults</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing the physical and social similarity of pre-school education classes</td>
<td>T36</td>
<td>1</td>
</tr>
<tr>
<td>and primary school classes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocabulary development studies</td>
<td>T31</td>
<td>1</td>
</tr>
<tr>
<td>Students starting pre-school education as young as possible</td>
<td>T41</td>
<td>1</td>
</tr>
<tr>
<td>Regular parent education on topics such as the aims of pre-school education</td>
<td>T39</td>
<td>1</td>
</tr>
<tr>
<td>literacy teaching method, child raising</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 8 was examined, while 12 of the participating teachers indicated that students should learn the school and classroom rules, 10 of them indicated that there was a need for regular education for parents on the issues such as informing them about the aims of pre-school education and the literacy teaching method. T48 stated that "The child whose mother does everything does nothing, he cannot take his book, he waits, because his mother or father always did all the work for him, he never did them on his own".
Quantitative Findings of the Study

Before the factor analysis to be performed to test the construct validity of the scale, Kaiser-Meyer Olkin (KMO) and Bartlett test results were examined to determine whether the data were appropriate and normally distributed, and the values were found to be KMO=.958 and Bartlett's Test <.000. The fact that the KMO test is higher than .60 and the Barlett test is significant indicates that the data are suitable for factor analysis (Büyüköztürk 2007). Based on this information, it can be said that the data are suitable for factor analysis. The factor analysis results and the reliability values of the whole scale are presented in Table 9.

<table>
<thead>
<tr>
<th>Item</th>
<th>Common Variance</th>
<th>Component-1 Factor Loading</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>Item Total Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>m45</td>
<td>.794</td>
<td>.817</td>
<td>.806</td>
<td></td>
<td></td>
<td>.765</td>
</tr>
<tr>
<td>m44</td>
<td>.750</td>
<td>.800</td>
<td>.777</td>
<td></td>
<td></td>
<td>.750</td>
</tr>
<tr>
<td>m42</td>
<td>.818</td>
<td>.861</td>
<td>.771</td>
<td></td>
<td></td>
<td>.811</td>
</tr>
<tr>
<td>m38</td>
<td>.762</td>
<td>.821</td>
<td>.763</td>
<td></td>
<td></td>
<td>.769</td>
</tr>
<tr>
<td>m37</td>
<td>.742</td>
<td>.814</td>
<td>.748</td>
<td></td>
<td></td>
<td>.765</td>
</tr>
<tr>
<td>m43</td>
<td>.737</td>
<td>.815</td>
<td>.722</td>
<td></td>
<td></td>
<td>.760</td>
</tr>
<tr>
<td>m50</td>
<td>.740</td>
<td>.840</td>
<td>.692</td>
<td></td>
<td></td>
<td>.796</td>
</tr>
<tr>
<td>m28</td>
<td>.687</td>
<td>.802</td>
<td>.652</td>
<td></td>
<td></td>
<td>.748</td>
</tr>
<tr>
<td>m8</td>
<td>.718</td>
<td>.715</td>
<td>.795</td>
<td></td>
<td></td>
<td>.666</td>
</tr>
<tr>
<td>m7</td>
<td>.677</td>
<td>.706</td>
<td>.760</td>
<td></td>
<td></td>
<td>.652</td>
</tr>
<tr>
<td>m9</td>
<td>.633</td>
<td>.701</td>
<td>.722</td>
<td></td>
<td></td>
<td>.651</td>
</tr>
<tr>
<td>m4</td>
<td>.612</td>
<td>.694</td>
<td>.702</td>
<td></td>
<td></td>
<td>.643</td>
</tr>
<tr>
<td>m2</td>
<td>.582</td>
<td>.699</td>
<td>.651</td>
<td></td>
<td></td>
<td>.645</td>
</tr>
<tr>
<td>m17</td>
<td>.586</td>
<td>.712</td>
<td>.644</td>
<td></td>
<td></td>
<td>.677</td>
</tr>
<tr>
<td>m6</td>
<td>.516</td>
<td>.656</td>
<td>.627</td>
<td></td>
<td></td>
<td>.608</td>
</tr>
<tr>
<td>m10</td>
<td>.514</td>
<td>.684</td>
<td>.572</td>
<td></td>
<td></td>
<td>.647</td>
</tr>
<tr>
<td>m35</td>
<td>.718</td>
<td>.640</td>
<td>.821</td>
<td></td>
<td></td>
<td>.559</td>
</tr>
<tr>
<td>m25</td>
<td>.565</td>
<td>.644</td>
<td>.752</td>
<td></td>
<td></td>
<td>.335</td>
</tr>
<tr>
<td>m47</td>
<td>.593</td>
<td>.626</td>
<td>.651</td>
<td></td>
<td></td>
<td>.623</td>
</tr>
<tr>
<td>m41</td>
<td>.634</td>
<td>.719</td>
<td>.605</td>
<td></td>
<td></td>
<td>.711</td>
</tr>
<tr>
<td>m34</td>
<td>.643</td>
<td>.735</td>
<td>.583</td>
<td></td>
<td></td>
<td>.726</td>
</tr>
<tr>
<td>m51</td>
<td>.540</td>
<td>.681</td>
<td>.549</td>
<td></td>
<td></td>
<td>.666</td>
</tr>
<tr>
<td>m15</td>
<td>.409</td>
<td>.526</td>
<td>.521</td>
<td></td>
<td></td>
<td>.513</td>
</tr>
<tr>
<td>m22</td>
<td>.419</td>
<td>.568</td>
<td>.510</td>
<td></td>
<td></td>
<td>.552</td>
</tr>
</tbody>
</table>

When Table 9 was examined, it was observed that while the factor loadings of the items in the first factor varied between .806 and .652, the factor loadings of the items in the second factor varied between .795 and .572, the factor loadings of the items in the third factor varied between .821 and .510, and all factors explained 64.111% of the variance. Cronbach's Alpha values of the factors and the whole scale were calculated as .953; .903; .857; .948, respectively. According to Büyüköztürk (2007), it is sufficient that the factor loadings of the items are higher than .45, the variance explained is 2/3, and the Cronbach's Alpha is above .70. It can be said that EPE was a valid and reliable scale since the data of the study met these conditions. The scale items were examined in terms of content, and the first
The fit index results obtained as a result of the CFA and the criteria used to evaluate these results are presented in Table 10.

Table 10. CFA Fit Indices of EPE

<table>
<thead>
<tr>
<th>Fit Indices</th>
<th>Research Finding</th>
<th>Perfect Fit</th>
<th>Acceptable Fit</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>χ2/sd</td>
<td>2.141</td>
<td>≤ 3</td>
<td>≤ 5</td>
<td>Perfect Fit</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.067</td>
<td>≤ .05</td>
<td>≤ .08</td>
<td>Acceptable Fit</td>
</tr>
<tr>
<td>RMR</td>
<td>.026</td>
<td>≤ 0.05</td>
<td>≤ 0.08</td>
<td>Perfect Fit</td>
</tr>
<tr>
<td>SRMR</td>
<td>.049</td>
<td>≤ 0.05</td>
<td>≤ 0.08</td>
<td>Perfect Fit</td>
</tr>
<tr>
<td>IFI</td>
<td>.941</td>
<td>≥ .95</td>
<td>≥ .90</td>
<td>Acceptable Fit</td>
</tr>
<tr>
<td>GFI</td>
<td>.874</td>
<td>≥ .90</td>
<td>≥ .85</td>
<td>Acceptable Fit</td>
</tr>
<tr>
<td>NNFI</td>
<td>.924</td>
<td>≥ .95</td>
<td>≥ .90</td>
<td>Acceptable Fit</td>
</tr>
<tr>
<td>CFI</td>
<td>.940</td>
<td>≥ .95</td>
<td>≥ .90</td>
<td>Acceptable Fit</td>
</tr>
</tbody>
</table>

When Table 10 was examined, it was observed that the fit of model was tested by the criteria of chi-square (χ2) fit index and χ2/Degrees of Freedom (S.D.), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Root Mean Square Residual (RMR), Standardized Root Mean Square Residual (SRMR), Goodness of Fit Index (GFI), Non-Normed Fit Index (NNFI), and Incremental Fit Index (IFI).

As a result of the analyses, ratio of the degree of freedom (SD) to the chi-square (χ2) fit index can be considered as a criterion for competence, and to this end, χ2/S.D. ≤ 3 indicates a perfect fit, and χ2/S.D. ≤ 5 and below indicates acceptable fit (Gürbiç, 2019). In the study, a perfect fit was obtained by the value χ2/S.D. = 464.655/217 = 2.141, (p<.000). While a RMSEA value of ≤ .05 indicates a good fit, the values between .05 and .08 indicate an adequate fit, and the values between .08 and .10 indicate a mediocre fit, the values of >.10 are not acceptable (Schermelleh-Engel & Moosbrugger, 2003; Browne & Cudeck, 1992). In the study, the RMSEA value was found to be .067, and an acceptable fit was achieved. RMR ≤ 0.05 is considered perfect fit, RMR ≤ 0.08 is considered acceptable fit (Byrne, 2005), SRMR ≤.08, preferably below ≤.05 is considered sufficient (Gürbiç, 2019). Since the findings of RMR=.026 and SRMR=.049 were obtained in the study, perfect fit was obtained in these fit indices. IFI ≥ .90 indicates an acceptable fit, ≥ .90 indicates a perfect fit, GFI ≥ .85 and above indicates an acceptable fit, ≥ .90 indicates a perfect fit (cited from Schumacher and Lomax, 2004 by Seçer, 2005), CFI and NNFI values of ≥ .95 indicate a perfect fit and ≥ .90 indicates an acceptable fit (Sümer, 2000). In the study, these values were found to be .941; .874; .924; .940, respectively, and acceptable fit values were reached in the indexes.

Scoring of the Scale

The scale consists of 3 factors with 8 items in each factor, and 24 items. The scale prepared in 5 point Likert type includes options from 1 to 5 (very low, low, medium, high, very high). The scale can be scored in two ways in order to determine the expectation levels of the participants and the level of need for the activities specified in the items of the scale. For the expectation level of the participants, a minimum of 8, a maximum of 40 points can be obtained from a factor, and a minimum of 24 and a maximum of 120 points can be obtained from the whole scale. The scale has no item requiring reverse scoring, and it is interpreted that the level of expectation from preschool education increases as the score obtained from the scale is increases, and that the expectation from preschool education decreases as the score obtained decreases. The group width values suggested by Sarı et al. (2018) were used to determine the level of need for the activities specified in the items. Based on the formula 4/5=0.80 for five-point Likert scales, the group widths were determined with values between 1.00 -1.80 indicating very low, 1.80-2.60 indicating low, 2.60-3.40 indicating moderate, 3.40-4.20 indicating high, and 4.20-5.00 indicating very high. By taking the arithmetic mean of the scores

factor was named as listening and speaking competencies, the second factor was named as school adaptation competencies, and the third factor was named as literacy competencies.
obtained by the participants from the items, the level of need for the activities specified in that item was interpreted by comparing them with the above-mentioned values. The need for the activities in the factors can be calculated by applying the same evaluation method within the context of the factor. The exemplification related to scoring was made with the CFA data group and presented in the last part of the findings.

The Pearson Correlation coefficient was calculated to determine the correlation between the factors of the scale and the whole scale, and the data obtained are presented in Table 11.

**Table 11. EPE Components Correlation Matrix**

<table>
<thead>
<tr>
<th>Factor</th>
<th>EPE</th>
<th>B1</th>
<th>B2</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 (Listening-Speaking)</td>
<td>.911*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2 (School Adjustment)</td>
<td>.879*</td>
<td>.779*</td>
<td></td>
</tr>
<tr>
<td>B3 (Reading-Writing)</td>
<td>.869*</td>
<td>.667*</td>
<td>.596*</td>
</tr>
</tbody>
</table>

**p<.01**

In correlation analysis, a correlation value between 0.70-1.00 indicates a high level of correlation, a value between 0.70-0.30 indicates a moderate level of correlation, and a value between 0.30-0.00 indicates a low level of correlation (Büyüköztürk, 2007). When Table 11 was examined, it was observed that the correlation of the factors with the whole scale was significant at the level of r=.911, r=.879, r=.869, respectively, and that the correlation between the factors was significant at the level of r=.596, r=.667 and r=.779 and p<.000, respectively. Since the factors were highly correlated with the whole scale, the scale can be scored both at the factor level and as a whole.

**Findings on Classroom Teachers' Expectations from Pre-School Education**

In the final stage of the study, the scores of the CFA group from the EPE scale were evaluated. While the mean score of the listening speaking competencies factor of the study group was calculated as 37.59, the mean scores of the school adjustment competencies factor and the literacy competency factor were calculated as 37.30 and 34.68, respectively, and the mean total score was calculated as 109.58. Considering that minimum 24 and maximum 120 points can be obtained from the scale, it can be stated that the expectations of the study group from pre-school education were high. The expectation levels within the context of the items and factors in the scale are presented in Table 12.

**Table 12. Classroom teachers' expectations from pre-school education**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Scale items</th>
<th>Z</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Item Mean Score</th>
<th>Factor Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Ensuring that students make eye contact with the speaker while listening</td>
<td>255</td>
<td>3</td>
<td>5</td>
<td>4.69</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Performing activities that support students to communicate with their peers</td>
<td>255</td>
<td>3</td>
<td>5</td>
<td>4.65</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Performing attention-developing activities while listening</td>
<td>255</td>
<td>3</td>
<td>5</td>
<td>4.71</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Performing activities to teach the rules of speaking with games</td>
<td>255</td>
<td>3</td>
<td>5</td>
<td>4.69</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Developing students' listening skills with games</td>
<td>255</td>
<td>3</td>
<td>5</td>
<td>4.74</td>
<td>4.7</td>
</tr>
<tr>
<td>44</td>
<td>Performing activities that support students to form sentences in the</td>
<td>255</td>
<td>3</td>
<td>5</td>
<td>4.71</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Performing activities that will allow students to listen in accordance with</td>
<td>255</td>
<td>3</td>
<td>5</td>
<td>4.74</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Performing activities that support students to use language for communication purposes</td>
<td>255</td>
<td>2</td>
<td>5</td>
<td>4.67</td>
<td></td>
</tr>
</tbody>
</table>
When Table 12 was examined, participants indicated that it was mostly needed to perform activities to develop listening skills with games (\(X̄=4.71\)) and to enable students to listen in accordance with the rules (\(X̄=4.71\)) in the listening speaking competencies factor, that it was mostly needed to perform activities that enable students to develop positive attitudes towards school (\(X̄=4.73\)) in the school adjustment competencies factor, that it was mostly needed to perform activities to improve reading awareness (\(X̄=4.58\)) in the literacy competencies factor, and that it was mostly needed to perform activities related to the listening-speaking competence factor (\(X̄=4.7\)) within the context of the factor. Since the value of 4.7 was between 4.20-5.00, it can be said that the expectations of this group from pre-school education in the listening-speaking competence factor were very high.

### CONCLUSION AND DISCUSSION

The data of the study were discussed in accordance with the mixed method design and the steps of the exploratory sequential design. First, the qualitative and quantitative data on classroom teachers' expectations from pre-school education within the context of literacy were discussed, and then the validity and reliability results of the EPE were discussed.

When the qualitative data collected from the participating teachers were examined, it was observed that the expectations of teachers from pre-school education were collected under the themes of listening, speaking, reading, writing and school adjustment. In the study conducted by Yapıcı and Ulu (2010) to determine the expectations of classroom teachers from pre-school teachers, the themes of adaptation to school, the studies on preparation for literacy were reached, and apart from these themes, the needs determined as prerequisites for teaching literacy were listed, and the competencies related to listening and speaking were included. In a study conducted by Kırat and Güven (2021) to determine the views of children about the transition from pre-school education to primary school, classroom teachers used the expression "expectation" by 62.7% while expressing their views. Based on this information, it can be said that centering expectation in the present study, and the themes reached were consistent with the literature.

Classroom teachers in the study group indicated that children needed to learn listening rules (n=12) and to be encouraged to speak (n=12) while listing their expectations from pre-school
education. In the quantitative findings of the study, it was stated that activities (X̄=4.65) that support students’ communication with their peers should be performed. Children acquire the listening and speaking skills in the family environment, however, these skills are developed through learning at school (Michaels, 1986). These skills that children acquire before they come to school are the variables that affect their literacy learning (Connor et al., 2005). Vandergrift (2004) states that listening is the most implicit and most difficult developing skill among language skills. McNaughton et al. (2008) drew attention to the relationship between listening and speaking skills by stating that listening is an important factor in the communication process between individuals. The fact that the participating teachers mentioned listening rules together with the students' need for encouragement to speak may be due to the relationship between these skills. In this context, designing activities to develop children's listening skills during the pre-school education period may encourage them to communicate by speaking depending on the listening-speaking interaction.

When the findings of the study on reading and writing were examined, classroom teachers indicated that they needed activities that would develop students' ability to sense, recognize and distinguish sounds (n=9), hold the pencil correctly and develop finger muscles (n=20). Phonological level is an important factor in the acquisition of reading skills (Plaza & Cohen, 2003). However, children may not have reached the expected competency in terms of phonology in the pre-school period (Bryant et al., 1990). Since learning to read is associated with phonology, children with phonological deficiencies may be in the risk group in learning to read and write (Carroll & Snowling, 2004). Children in this situation can be provided with a qualified pre-school education to acquire the phonological skills (O’connor et al., 1996; Pullen & Justice, 2003). Writing education is another skill that should be considered in the pre-school period and should not be left in the background (Jones & Reutzel, 2014). Reading books to children in the pre-school period may support their language development by intensely exposing them to written language (Bus et al., 1995). Moreover, the activities to develop students' hand muscles will support their legibility (Reis, 1989). Ertürk-Kara (2019) draws attention to the effect of the family in providing the fine muscle development necessary for the habit of holding the pencil correctly, which is the basis of children's writing skills. With the measures to be taken to meet the need for parent education (X̄=4.64) in the quantitative findings of the present study, the needs for correct pencil holding and muscle development of children stated by classroom teachers in qualitative findings can be met.

With regard to the school adjustment competencies of children in the qualitative findings of the study, classroom teachers indicated that they students needed to learn school and classroom rules (n=12), parents needed to be educated (n=10), and children's self-care skills needed to be developed (n=9). In the quantitative findings of the study, it was stated that the same competencies were needed at a very high level (X̄=4.71, X̄=4.68, X̄=4.64). In the phenomenological study conducted by Sarıçelik and Saban (2021) to determine the perceptions of difficult children by classroom teachers, one of the themes created was the theme of unruly boy. In the study conducted by Yaraş and Turan (2021), students' failure to obey the class rules was determined as an undesirable situation that classroom teachers encountered in classroom management, and the teachers in the study group suggested cooperation with the family to solve this problem. The fact that children come ready to primary school is one of the determinants of their success (Fridani 2020). Korucu and Schmitt (2020) indicated that the home environment and parental attitudes improved children's school readiness skills. Stewart (2016) emphasized that parents should consciously perform their roles so that their children would be ready for preschool education. The fact that children learn to live according to the rules and receive self-care education in the home environment will support them to be in the school environment independently of their parents when they start primary school. Children whose self-care needs, such as meeting toilet need, feeding, and maintaining personal cleanliness at school, are met by their parents may have problems in separating from their parents at school. The fact that children acquire self-care skills during pre-school education period may also be a solution to the problems of students acting independently from their parents indicated by classroom teachers in the quantitative findings of the study (X̄=4.71). In the study conducted by Erbasan and Erbasan (2020), participating classroom teachers indicated that they cared about being in communication with parents in the literacy teaching process and that parents' awareness would reduce the problems experienced by classroom teachers.
According to these evaluations, it can be said that educating parents in the fields of child development, early literacy and conscious parenting may decrease the possible problems in literacy teaching in primary school.

The measurement tool consisting of three factors and 24 items was developed based on the qualitative data obtained from the classroom teachers who participated in the study. In the analysis performed with the data collected from the classroom teachers (n=375) for the purpose of EFA, it was determined that the factor loadings of the items varied between .510 and .821, and that all factors explained 64.111% of the variance. Cronbach's Alpha values of the factors and the whole scale were calculated as .953; .903; .857; .948, respectively. All of the fit indices obtained as a result of CFA performed with the data collected from a different research group (n=255) were determined to be at an acceptable or perfect fit level, and the factor structure formed as a result of EFA was confirmed by CFA. The structures such as listening, monitoring, comprehension, phonological awareness, writing awareness, and basic writing skills similar to the factors obtained in the presented were obtained in the measurement tool developed by Delican and Ateş (2021) to determine the early literacy development of children. It was determined that the fit indices obtained as a result of the CFA applied for this measurement tool were at an acceptable level, similar to the CFA results of EPE. Cognitive, affective, psychomotor, and self-care factors were reached in the scale developed by Canbulat and Kırlıktaş (2016) to determine the readiness level of children for primary school. When the items in the scale were examined, it was observed that there were similar items in the scale developed in the present study on pencil holding, self-expression, visual reading, and activities requiring hand and eye coordination, muscle development, and self-care skills, and the factor loadings of the scale items were found to be between .589 and .820 and were close to the factor loading values of the items in the present study.

**Recommendations**

Based on the findings of the study, the following recommendations were made to educators, researchers and policy makers.

(i) The validity and reliability of the scale can be tested by applying the measurement tool to classroom teachers working in different regions. (ii) By applying the scale to classroom teachers working in primary schools with kindergarten, the teaching activities in the kindergarten can be performed in a way that focuses on the needs stated by the classroom teachers. (iii) The expectations of classroom teachers from pre-school education can be examined by analyzing the mean scale scores according to the demographic characteristics of the sample group. (iv) Classroom teachers and preschool teachers can be brought together during their professional working periods so that they can evaluate the expectations of classroom teachers from pre-school education together.

**Declaration of commitment to the ethical rules**

Approval was received for this study from the participants and Turkey/Bursa Uludağ University Research and Publication Ethics Committee. Scientific research ethics were followed during the study.

**Declaration of conflict of interest**

The authors have no conflict of interest with any institution or person regarding this paper.

**REFERENCES**


Investigation of the Effectiveness of Hybrid Learning on Academic Achievement: A Meta-Analysis Study

İbrahim Yaşar Kazu
Fırat University

Cemre Kurtoğlu Yalçın
Ministry of National Education

Abstract

Hybrid learning based on the integration of traditional face to face and online teaching-learning paradigms has become popular with the improvement of technology. This popularity creates a need for making a reinterpretation of the findings of recent empirical studies conducted on the effectiveness of hybrid learning. Thus, it is aimed to present the overall effect of hybrid learning on students’ academic achievements by analyzing 45 research findings obtained from 44 quantitative studies published between 2010 and 2020. Relevant studies were identified from the databases of scholarly publications. The sample was examined using the Comprehensive Meta-Analysis (CMA) program. Publication type, education level, discipline, and duration of the intervention were determined as moderator variables. The results show that the effect of hybrid learning on students’ achievement is statistically higher ($d = 1.032$) in the random-effects model. A heterogeneous distribution was obtained from the sample Further subgroup analyzes using Analog ANOVA revealed that only the discipline variable is statistically significant. It was concluded that the discipline of biology has the highest effect size and the discipline of science has high effect size respectively. Furthermore, the impacts of these findings were discussed and relevant suggestions were given for future researches.

Keywords: Academic Achievement, Effect Size, Hybrid Learning, Meta-Analysis

DOI: 10.29329/ijpe.2022.426.14
INTRODUCTION

The highly contagious Covid-19 virus, emerged towards the end of 2019, spread rapidly all over the world in a short time, especially in Europe (WHO, 2020). In order to break the transmission chains of the Covid-19 virus, which is rapidly transmitted by human contact and respiration (Huang et al., 2020), the activities of educational institutions, which are one of the institutions where human contact is intense, have been suspended (De Luca, 2018). The impact of Covid-19 on updating educational activities is anticipated to be significant moving forward (Bragg, Walsh & Heyeres, 2021). In this context, due to the pandemic all over the world, central exams were postponed, face-to-face education activities were terminated, and distance education was conducted (Can, 2020). In the 21st-century, with the rapid development of technology and the speed of access to information, distance education activities have been rapidly adopted all over the world, and the use of hybrid education applications that combine traditional education with distance education has come to the fore in the post-pandemic period. Hybrid learning, considered as the final point reached in distance education, where technology and educational applications meet, has become the focus of attention of educators and researchers.

Pesen (2014) defined hybrid learning as an ideal approach for combining the strongest aspects of classroom and online learning and developing the knowledge and communication skills necessary for success. It is inferred that the main purpose is to contribute to the learning of students by making the most effective and efficient use of the educational environment created by combining face-to-face learning with technology-supported teaching. In the hybrid learning process, face-to-face lessons are taught with in-class activities, while some activities and practices should continue outside the classroom. In order to carry out these practices outside the classroom in an appropriate way, there is a need for an auxiliary tool that can manage the distance education process (Çırak Kurt et al., 2018). Some web tools are used for presenting and managing learning material and course content on the web in the distance part of blended learning environments, sharing the presented material in different ways such as chat or discussion platforms, evaluating and observing the students’ performance, homework, exams, providing feedback on assignments and exams. These web tools include Moodle, Blackboard, Edpuzzle, Blogs, Camtasia Studio, E-learning Platform, Google Docs, Learning Management Systems, Blackboard, Khan academy, Moodle, Prezi, Storyline, Youtube.

A brief literature analysis shows that many independent studies are examining the effect of hybrid learning application on students’ academic success. An examination of the studies in the literature demonstrates that some studies reported that blended learning application increased academic success (Author & XXX, 2014; Obiedat et al., 2014; Umar & Reis, 2014; Gürdoğan & Bağ, 2018; Roomy & Althewini, 2019; Al-Qatawneh et al., 2020; Kadirhan & Korkmaz, 2020), while others have revealed that it has no effect on academic achievement (Arano-Acuaman, 2010; Li et al., 2013; Öner et al., 2014; Çiftçi & Dönmez, 2015). Given this situation, this study aims to conduct a reliable meta-analysis study called analysis of analysis in a systematic effort to interpret the findings of previous studies and to guide future research. Although there are a number of meta-analysis studies in the literature (Batd, 2014; Çırak Kurt, Yıldırım, & Cücük, 2018; Kök, 2018; Korucu & Kabak, 2020; Means et al., 2013; Bernard et al., 2014; Vo et al., 2017; Mahmud, 2018), there is not a comprehensive international meta-analysis for the period of 2010-2020. Especially following the onset of the coronavirus pandemic, the emergence of distance education has also increased the popularity of hybrid learning, and the continuation of education based on this learning has come to the fore. For this reason, a meta-analysis study on this subject is considered necessary to investigate the quantitative results of existing studies which have examined the effect of hybrid learning on academic achievement. As a consequence, the current study set out to synthesize these results and establish the overall magnitude of the effect. For this main purpose, answers to the following research questions (RQ) were sought:

RQ1. What is the effect size of hybrid learning on academic achievements?
RQ2. How does the effect of hybrid learning on academic achievements vary as a function of moderator variables (education levels, type of publication, disciplines, and intervention duration)?

**Research Methodology**

The meta-analysis statistical method following the meta-analytic procedures suggested by Glass et al. (1981), which include (1) literature search and inclusion criteria, (2) coding the features of the studies, (3) calculating the effect sizes of each study’s outcome measures, and (4) investigating the moderating effects of a study’s characteristics on the outcome measures is selected.

**Literature Search and Inclusion Criteria**

The data were collected from articles, master and doctoral theses that met the inclusion criteria given in Table 1. Studies were identified with the help of national and international databases in the field of education and published electronically such as ERIC, Web of Science, EBSCOHost, Google Scholar, SCOPUS, PROQUEST, CHE Thesis Center from January to March 2021. In addition, the bibliography sections were examined in the studies reached, in an effort to identify earlier works that may not have been published electronically.

**Table 1 Inclusion criteria for the selection of studies**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication period</td>
<td>Completed between 2010 and 2020.</td>
</tr>
<tr>
<td>Publication type</td>
<td>An article published in a national or international refereed journal or a</td>
</tr>
<tr>
<td></td>
<td>master’s / doctoral thesis.</td>
</tr>
<tr>
<td>Language</td>
<td>Turkish or English.</td>
</tr>
<tr>
<td>Research design</td>
<td>An experimental design with a control group. The control group should be</td>
</tr>
<tr>
<td></td>
<td>taught with the traditional method, while the experimental group with the</td>
</tr>
<tr>
<td></td>
<td>hybrid learning.</td>
</tr>
<tr>
<td>Outcome</td>
<td>Academic achievement</td>
</tr>
<tr>
<td>Implementation</td>
<td>Measure the effect of the hybrid learning in the field of education.</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Full text available.</td>
</tr>
<tr>
<td>Data</td>
<td>Sample size, standard deviation, and mean values.</td>
</tr>
</tbody>
</table>

The researchers identified some keywords to assist the resource search. Binary combinations of such keywords as ‘blended learning and academic achievement’, ‘hybrid learning and academic achievement’, ‘mixed-mode learning and academic achievement’ were scanned in all databases during the research. Overall, the keyword search provides 1326 studies. Next, 489 studies were eliminated because of the duplication, and 593 of them were removed for not being suitable for the research problem. Considering the inclusion criteria, 200 studies were deemed inappropriate. As a result, 44 were selected to form the study sample. However, as Pesen and Oral (2014) showed the effect of hybrid learning on success in their study by working with 2 different disciplines, the researchers were able to increase the size of the sample to 45. A Prisma flow diagram in Figure 1 shows the search and selection process.
Coding the Features of the Studies

The data of the studies included in the scope of the study were coded by opening an Excel file and numbering the studies. In order to ensure the reliability of the data encoded in the research, the coding process was performed by the first coder having a doctorate in the field of curriculum instruction and education, and also by the second coder, being an expert in that field. After the coding process was completed, the compatibility between the coders was evaluated. Inter-encoder reliability calculation \( \left( \frac{\text{consensus}}{\text{consensus} + \text{disagreement}} \times 100 \right) \) (Miles & Huberman, 1994) and the reliability was found to be 98%.

The validity of a meta-analysis study is proportional to the validity of the studies included in the study (Petitti, 2000). In this context, the validity findings of the studies included in the study were examined and an effort was made to ensure their validity. Besides, studies using inappropriate data and research methods were not included in the meta-analysis and contributed to increasing their validity.

Data Analysis

The data analysis process includes the calculation of the effect size for each study, the control of publication bias, the heterogeneity test, and the calculation of the combined effect size. The Comprehensive Meta-Analysis (CMA Version 3) program was used to analyze the data. The analyses in this study were performed by calculating the ‘Cohen d’ values. Cohen’s (1988) effect size classification is as follows:
Two different models are used in the calculation of effect sizes in meta-analysis. These are fixed effects model and random-effects model. The researcher needs to determine in advance which model to act according to the analysis process (Dinçer, 2014). In order to make a more generalizable study and because it is a model recommended to be used in the field of social sciences (Cumming, 2012), this study was based on the random-effects model. On the other hand, meta-analysis aims to determine how the effect size varies across studies. In this respect, the random-effects model has a distribution of true effects. Regarding that the moderator effect can vary across studies, as well as the sampling variability, the random-effects size model was selected to match the expected heterogeneity in this meta-analysis.

**RESEARCH RESULTS**

**Meta-Analysis Findings of the Studies Included in the Study**

In meta-analysis studies, a general conclusion is drawn from the effect size of each study. So as to examine the effect of hybrid learning on the students’ academic achievement, 45 studies were included in the meta-analysis process, and the effect size for all studies included in the meta-analysis was calculated. Findings regarding general effect size and heterogeneity were given in Table 2.

Table 2 Table of heterogeneity, confidence interval, and average effect size regarding the effect of hybrid learning on academic achievement

<table>
<thead>
<tr>
<th>Model</th>
<th>K</th>
<th>ES</th>
<th>Lower</th>
<th>Upper</th>
<th>Z</th>
<th>p</th>
<th>Q</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>45</td>
<td>0.777</td>
<td>0.705</td>
<td>0.850</td>
<td>20.956</td>
<td>.000</td>
<td>443.328</td>
<td>.000</td>
</tr>
<tr>
<td>Random</td>
<td>45</td>
<td>1.032</td>
<td>0.800</td>
<td>1.264</td>
<td>8.726</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As seen in Table 2, heterogeneity test is significant (Q model = 443.328; df (Q) = 46; p = .000). On the other hand, $I^2$ value above 75% is an indicator of high heterogeneity (Higgins & Thompson, 2002), $I^2$ value can be interpreted that it is 89% highly heterogeneous ($I^2 = 89.624$). The examination of the obtained data showed that the effect size was 0.777 by the fixed effect model and the random effect model effect size was 1.032 and was significant (p = .00 < 0.5). The latter corresponds to a ‘large effect’ value according to the effect size classification of Cohen et al. (2007). A forest plot of the studies demonstrating the distribution of effect size values calculated by the random-effects model is shown in Figure 2.
Figure 2 Forest plot demonstrating the distribution of effect size

In the forest plot, the part determined with black vertical lines indicates the effect size of the relevant study in the meta-analysis, while the horizontal lines around it indicate that the effect size of that study is in the 95% confidence interval. In other words, the longer the horizontal line, the larger the confidence interval is. According to the forest plot given in Figure 2, it is seen that the study with the largest confidence interval was attributed to Yağlı (2020), while the study with the smallest confidence interval was published by Fazal and Bryant (2019).

When Figure 2 is examined in terms of effect sizes of the studies included in the meta-analysis, it can be seen that the study of the lowest effect size (d = 0.014) belongs to Gürdoğan and Bağ (2020), the largest belongs to (d = 6.675) Yağlı (2020). While 30 studies (66.66%) have effect sizes below the average effect size, it is seen that 15 studies (33.34%) have a value above the average effect size of the study.
Publication Bias

Publication bias was evaluated using a funnel plot, the classic fail-safe N, and Orwin’s fail-safe N. As shown in Figure 3, it was found that the funnel plot had a symmetrical distribution. Therefore, there was no publication bias in the present meta-analysis. The results of the classic fail-safe N indicated that 6721 missing studies far larger than 235 (5k+10) would be needed to nullify the effect size. Furthermore, the result of Orwin’s fail-safe N revealed that 3607 missing studies would be needed to reduce Cohen’s d to a trivial level (0.01). Therefore, the findings indicated that this meta-analysis was not affected by publication bias.

Findings Regarding the Moderator Variables

Studies included in the sample for meta-analysis consist of articles, masters and doctoral dissertations. Due to the scarcity of master’s and doctoral theses, they were combined and included in the moderator analysis under the ‘theses’ subgroup. The findings obtained as a result of the analysis were presented in Table 3.

Table 3 Effect of hybrid learning on academic achievement according to the type of publication

<table>
<thead>
<tr>
<th>Moderator Variable</th>
<th>Heterogeneity</th>
<th>P</th>
<th>K</th>
<th>ES</th>
<th>CI (95%)</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Article</td>
<td>0.892</td>
<td>0.345</td>
<td>34</td>
<td>0.960</td>
<td>[0.703; 1.216]</td>
<td>0.13</td>
</tr>
<tr>
<td>Thesis</td>
<td>1.242</td>
<td>1.242</td>
<td>11</td>
<td>1.242</td>
<td>[0.715; 1.769]</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Table 3 shows that the highest effect size belonged to the thesis type (ES = 1.242), and lower effect size to article type (ES = 0.960). It can be stated that there is no significant difference according to the type of publication of the studies (Q_b = 0.892; p = 0.342>.05).

The studies included in the meta-analysis were applied at primary, secondary, high school, and university. In order to explain the heterogeneity found, it was included in the moderator analysis. The findings obtained as a result of the analysis were presented in Table 4.
According to Table 4, the highest effect size was found at the secondary school level (ES = 1.515) and the lowest effect size at the primary school level (ES = 0.717). It can be said that there is no significant difference according to the education levels of the studies ($Q_b = 6.137; \ p = 0.10 > .05$).

In order to facilitate analysis, the various periods used by the studies in the sample to measure applications of hybrid learning were categorized as ‘2-5 weeks’, ‘6-9 weeks’, ‘10-13 weeks’, and ‘14 weeks and above’. The findings obtained as a result of the analysis were presented in Table 5.

According to Table 5, the highest effect size (ES = 1.319) was performed between 6-9 weeks, the lowest effect size (ES = 0.741) was performed for 14 weeks or more. It can be assumed that there is no significant difference according to the application time of the studies ($Q_b = 3.883; \ p = 0.27 > .05$).

The studies included in the meta-analysis were applied to investigate the effect of hybrid learning on the academic achievements of 13 different disciplines. However, the studies, which investigated the effectiveness of hybrid learning on the disciplines of German, chemistry, and material design, were removed from the Analog ANOVA since there was only one study of these disciplines. Thus, the findings obtained as a result of the analysis of 42 research findings were presented in Table 6.

According to Table 6, the highest effect size (ES = 2.097) was performed on the discipline of biology, the lowest effect size (ES = 0.371) was performed on the discipline of medicine. Considering the effect sizes between the groups formed according to the disciplines of the studies included in the meta-analysis ($Q_b = 22.748; \ p = 0.03 < .05$), it can be interpreted that there was a significant difference in the experimental group according to the discipline that the hybrid learning applied.
other words, it was determined that the effect size of the hybrid learning on academic achievement varies from the difference in the discipline in which hybrid learning applied.

DISCUSSION

Over the past decade, using learning environments supported by digital technology is being increasingly valued. Especially nowadays, the coronavirus pandemic has forced humanity to safeguard itself by interrupting every activity in which face-to-face communication takes place. The emergence of technology and a variety of electronic devices have gained a great deal of attention in educational settings. Recently, a lot of work, as well as education, has been continued online with the help of technology (Ioannou & Ioannou, 2020). Thus, even after the pandemic process, the integration of technology with education has been planned to put into practice in the coming periods. A series of innovative learning methods and courses using educational technologies and theories have also been used to enhance the effectiveness of student learning (Chang, Lee, Tang & Hwang, 2021). One of the innovative learning methods, hybrid learning which is based on combining face-to-face education with online teaching and learning by utilizing the pros of both approaches, became the focus of researchers and educators. On the other hand, the rapid development of technology is an encouraging situation to carry out current studies on this subject (Dikmen & Tuncer, 2018). Therefore, there has been a requirement for examining the results of the studies that investigated the effect of hybrid learning on academic achievement. Over the last decade, there have been several meta-analyses that have addressed the impact of hybrid learning environments and its relationship to learning effectiveness (Zhao et al. 2005; Sitzmann et al. 2006; Bernard et al. 2009; Means et al. 2010, 2013; Bernard et al. 2014). Each of these studies has found small to moderate positive effect sizes in favor of hybrid learning when compared to fully online or traditional face-to-face environments. With the need of updating these kinds of researches, this study aimed to determine the effect of hybrid learning on the academic achievement of students with the method of meta-analysis. In this context, 45 findings out of 44 studies that measure the effect of this model on academic achievement with the experimental method meeting the criteria were included in the meta-analysis process. As a result of the analysis, the distribution of the studies included in the meta-analysis (Q value = 443.328, df = 46, p =.000) was found to be heterogeneous. On the other hand, since it is known that a value of $I^2$ above 75% means that it is highly heterogeneous (Higgins & Thompson, 2002), $I^2=89.624$ and 89% proved to be highly heterogeneous. Hence, this result confirmed that high heterogeneity of the effect size may come from the variety of the design, type, application period, assessment, population, and quality of the selected studies. As a result of the analysis, it was observed that only disciplines explained a significant degree of effect size heterogeneity among the moderator variables that were determined to explain the heterogeneity.

The findings in this study were interpreted on the basis of the knowledge that it is more appropriate to use the random effects model in the field of social sciences (Field, 2010). The average effect size of the studies included in the meta-analysis was found $d = 1.032$; $p =.00$. According to Cohen’s (1988) classification, a large effect was concluded on this classification. In other words, it can be concluded that hybrid learning has a high level of positive effect on academic achievements. It has been seen that Batdi (2014) found the average effect size as $d =.66$ from 9 research findings. On the other hand, Çırak Kurt et al. (2018) and Kök (2018) reached similar results and found a moderate effect according to Cohen’s (1988) classification. Additionally, Means et al. (2013), Bernard (2014), Vo et al. (2017), and Mahmud (2018) reported that hybrid learning affected academic achievement positively. Accordingly, it is possible to comment that experimental studies that measure the effect of hybrid learning on academic achievements have reported a positive effect. Regarding this comment, our present study is considered to contribute a more meticulous perception of the impact of this type of learning on learners’ achievement compared with the traditional learning approach.

Publication Type

Since the studies included in the meta-analysis were approved by at least one jury or referee, they were selected from theses and articles. For the publication type, it was found that there was no
significant difference among the two publication types. This result was similar to the findings of Kök (2018). However, this study revealed that the highest effect size belongs to the article type in contrast to the study conducted by Kök (2018).

Education Level

The studies included in the meta-analysis consisted of studies conducted at primary, secondary, secondary, and higher education levels. However, no significant difference was reached, and it was concluded that the hybrid learning of the teaching level could not explain the effect on academic achievement. Similarly, Means et al. (2013) and Çırak Kurt et al. (2018) determined the teaching level as the moderator variable in their meta-analyses, the findings of these studies support this result. Çırak Kurt et al. observed the highest effect size on a secondary school level similar to this research findings.

Intervention

In this meta-analysis study on the effect of the hybrid learning on academic achievement, the duration of applying the model to the experimental group was determined as another moderator variable. It was understood that there was no significant difference according to the duration of intervention. In other words, the duration of applying the model to the experimental group did not affect the average effect size. Moreover, the present study revealed that the medium intervention duration (6-9 weeks) produced the largest effect size. The main reason might be that too long durations will produce potential variation, and too short durations cannot validate the effectiveness of the method (Zheng et al., 2020).

Discipline

The studies included in the meta-analysis were conducted in various disciplines. These were German, Arabic, physical education, computer, biology, educational technologies, science, English, chemistry, maths, material design, social studies, and medicine. Nevertheless, the studies conducted with German, chemistry, and material design were removed from the analysis since there was only one study. From the 42 findings, it was concluded that the studies with the highest effect size were the discipline of biology, the lowest effect size belonged to the discipline of medicine. It was concluded that there is a significant difference according to the discipline to which the hybrid learning was adopted. In other words, the effect size of the hybrid learning on academic achievement differs with the discipline that the hybrid learning was used. The present study confirmed that the discipline of biology and science has high effect size respectively and this result supports Vo et al. (2017) research findings as biology and science are one of the STEM disciplines. On the other hand, Stockwell et al. (2015), found that a hybrid learning is a more effective strategy for science education compared with traditional approaches. Similarly, Seage and Türeğün (2020) confirmed that students tend to achieve higher science scores when placed in a blended learning environment. These findings are supported by Bidarra and Russman (2015) who also claimed that blended learning bridged academic gaps for students especially in science education. Hwang et al. (2020) reached that the students educated with hybrid learning exhibited higher performance in science rather than the ones with traditional learning. In this respect, it is possible to comment that comparison of experimental studies that measure the effect of the hybrid learning on science education have reported a positive effect. Our present study is considered to contribute a more meticulous perception of the impact of this type of learning on learners’ science achievement compared with the traditional learning approach.

CONCLUSIONS AND IMPLICATIONS

To conclude, hybrid learning provides strong effects of both face-to-face and online education by gathering them in educational settings. The world is forced by current pandemic periods to use technology to achieve the goals. Thus, it can be anticipated that educators will have to continue to facilitate online teaching with face-to-face education in the future. This situation paves the way for a
need to examine the research findings based on the effects of hybrid learning on academic achievements. The present study aims to examine these studies meta-analytically. These findings are very promising and provide insight into the implementation of the hybrid learning in the future. This study concluded by the large effect size according to Cohen’s classification. On the other hand, it is understood that the effect size differs with the discipline in favor of biology and science. Consequently, this paper emphasized that hybrid learning paves the way of academic achievement especially in science and biology education. It is considered that this study contributes to the literature and shed the lights for researchers and readers to apply hybrid learning especially in science education.

In the light of the findings obtained at the end of the research, it was seen that the effect size of the hybrid learning on the academic achievement of the students was at a high level. In line with the results obtained, it was deemed appropriate to make the following suggestions:

- As a result of the analysis, it was understood that the hybrid learning had a large effect on the academic achievement of the students. For this reason, the use of hybrid learning in educational environments should be encouraged, and the necessary infrastructure and facilities should be provided.
- It was understood that the discipline was a distinctive variable on the academic achievement of hybrid learning. It was found that studies applied to the disciplines of biology and science had higher effect sizes. For this reason, it can be suggested that the application of the hybrid model in especially biology and science classes should be encouraged.
- This meta-analysis study focuses on publication type, education level, duration of intervention, and discipline as moderator variables. Future studies can focus on different aspects.

Acknowledgements

There is no acknowledgement.

REFERENCES


Author & XXX (2014). “Deleted for Peer Review”


NOTE: References marked with ‘‘ indicate studies included in meta-analysis.
Leader Administrator: A Qualitative Analysis Based on Teacher Opinions

Ramazan Ertürk
Ministry of National Education

Abstract

The aim of this study is to determine the leadership roles of school administrators based on teachers’ opinions. The participants of this case study, one of the qualitative research design, were 180 teachers working in 5 elementary schools, 4 secondary schools and 4 high schools in Bolu province in the 2020-2021 academic year. The data were collected using an interview form consisting of semi-structured questions and analyzed using the descriptive analysis method. The findings of the study indicated that the leader manager should be an ethical, facilitating, empowering, instructive, innovative, motivating, supportive and visionary manager. In accordance with the results of this study, it is recommended that school administrators should have an ethical character that exhibits impartial, reliable, fair, constructive, patient, courageous and democratic behavior.

Keywords: Leader, Administrators, Leader Administrators, Teacher Opinions.

DOI: 10.29329/ijpe.2022.426.15
INTRODUCTION

Schools are the most important educational institutions for the development of society and reaching the level of modern civilization. The fulfillment of this task could be possible with the effective and efficient management of schools, the success of teachers, students and well-educated generations. This fact requires school administrators who are at the most important and strategic point to fulfill their official duties as well as to have leadership skills since managing a school only by following official procedures would be inadequate to meet the requirements of the 21st century and the expectations of the community. In this context, the 21st century model of school administrator is supposed to inspire teachers and make them act together for a common goal. Thanks to his or her knowledge, characters and abilities, s/he should also guide and direct teachers, influence and motivate them about performing extra effort in addition to official work, as well as encouraging them to achieve the goals. School administrators are now expected not only to use their official authority, but also to show their ability to inspire, to be able to perform their duties in order to be effective by keeping up with the change and development in the 21st century in which innovations and changes are rapidly experienced. A leader is the administrator who takes their power both from the official authority given to them and from their ability to inspire, persuade and direct people.

What many definitions of a leader and leadership have in common is that a leader inspires, guides, directs and unites those around him under a common goal. Along with this, in the definitions made, the leader is the one who inspires and directs them to take an action for a common purpose (Sabuncuoğlu & Tüz, 2001). Similarly, the process of guiding and inspiring people about fulfilling the objectives of the institution (Hitt, Miller & Colella, 2006) is involved in the definition of a leader who directs, stimulates, unites teachers around the objectives of the institution and shows leadership behaviors by communicating effectively (Saylık, 2015). The leader inspires people and becomes a role model by stimulating the passion inside them. In addition to strategy, vision or strong ideas, he also appeals to people (Goleman, Boyatzis & McKee, 2002). The leader is the one who has the most influence and is expected to have the leadership responsibility (Hoy & Miskel, 2012). When the concept of leadership in education is taken into account, it is seen that the definitions made are customized on an institutional basis and contain characteristics similar to general definitions. Balcı (2009), for instance, defines the education leader as a critic, transformist, visionary, trainer, libertarian, authorized, ethical and liable person. Çelik (2015), on the other hand, expresses the school leader as the person who can transform the school’s environment and surroundings into a productive and contenting environment in order to ensure learning and teaching conditions for teaching the students efficiently. The person who is defined as the leader at school is the school administrator. The school administrator not only ensure that educational activities are carried out according to policies and laws, they also play an important role as a visionary, creative, initiator and leader person who turns changes into opportunities by taking risks and can use them for the benefit of the school (Gündüz & Balyer, 2012).

The leadership roles that school administrators are supposed to have are the roles that schools need to be effective and achieve their goals in a short time. Thanks to these roles and characters, they inspire teachers and students and become a role model for them (Taş, Çelik & Tomul, 2007). Existing literature reveals positive relations between school leadership and effective schools with the leadership characteristics of school administrators (Özdemir & Sezgin, 2002; Kazancıoğlu, 2008; Yılmaz, 2010; Bolanle, 2013; Boonla & Treputthrat, 2014). Accordingly, school administrators are expected to have contemporary leadership behaviors and fulfill their duties and responsibilities effectively in order to make their schools influential and productive. In the studies focusing on the duties and responsibilities of school administrators, leadership and the characteristics of a leader are emphasized. For instance, while Şişman and Turan (2002) stated the features and behaviors of 21st century school administrators in the form of leadership, communication, group processes, program development, teaching and learning processes, performance evaluation; Kurt (2009) indicated that the school administrator who spends most of his time with official routines such as controlling attendance and school administrators who spend most of his time with teachers and students by encouraging them to achieve and makes them feel special are different concepts from each other. In addition, Chang (2001 in Balcı, 2009)
emphasized that school administrators should be facilitators, conciliators, co-ordinators, problem solvers, observers, risk-takers who can maintain good relations among teachers, who can synthesize, concentrate on the purposes of education, who can use time effectively, who can develop education and support teachers to improve their quality, and who can take contributions for the school development from parents and the outer community of the school. As a result of innovations and changes in the concept of management, administrators with leadership power and ability, effective and successful administrators; institutions having leader administrators are also considered as successful institutions. Therefore, in the 21st century, the concepts of manager and administrator have been replaced by the leader administrator (Peker & Aytürk, 2000).

Meeting the requests of the employees of the institution for change contributes positively to the atmosphere of the institution. However, considering that the desires of employees for change are influenced by social structure and individual needs, it should be considered that the expectations of society and individuals would change as the structure of society and individual needs change. It is important for social harmony that schools, which are an important part of the education system and also one of the basic systems to meet social and individual expectations and needs, constantly renew and change themselves. In order to manage the process successfully, school administrators are expected to have leadership characteristics since it is very important for school administrators working at schools that will provide the innovation and change required in the 21st century to meet the educational needs of individuals and society by directing the behavior of teachers as a leader administrator. As for the significance of the study, it is considered that it will contribute to the literature by revealing the qualities of the leader administrator and guiding practitioners in the field. Furthermore, the aim of this study is to determine the leader executive roles of school administrators based on teachers’ opinions. Taking this into consideration, research questions were addressed as follows:

1. What does a leader administrator mean to you?
2. What personal traits are they supposed to have?

**METHODOLOGY**

**Research Design**

Case study, one of the qualitative research methods, was used in the research. Qualitative research method is used when it is desired to obtain in-depth and comprehensive information about a subject (Patton, 2014). The case study, on the other hand, provides researchers with the opportunity to closely examine the data they have obtained in a specific context, and enables the holistic and meaningful features of real events to be investigated and revealed (Yin, 2003; Creswell, 2015). The model provides a more comprehensive collection of data, a detailed analysis of the questions asked to participants, and a detailed analysis of the data (Strauss & Corbin, 1990). In this context, it has been tried to reveal the views of teachers towards the leader administrator in depth and in detail. In the collection of data, interview technique was used in accordance with the case study.

**Study Group**

The study group of the research consisted of 180 teachers who worked in 5 elementary schools, 4 secondary schools and 4 high schools in Bolu province in the 2020-2021 academic year and they participated in the research voluntarily. In determining the study group, voluntary participation was taken into account (Baki & Gökçek, 2012), and convenient sampling (Yıldırım & Şimşek, 2015) was used, allowing the researcher to reach the participants quickly and practically. 97 of the teachers in the study group were female and 83 were male teachers; 92 of them are class teachers and 88 of them are branch teachers. 30 of the teachers are between 1-5 years; 34 of them are between 6-10 years; 38 of them are between 11-15 years; 42 of them are between 16-20 years; 36 of them have 21 years or more seniority.
Data Collection and Instruments

In the study, an interview form consisting of semi-structured questions prepared with standardized open-ended question technique was used in order to reach a large number of participants and provide flexibility in data collection. Thanks to the interview form, it is possible to determine the similar and different opinions among the participants and make comparisons accordingly (Yıldırım & Şimşek, 2015). In the interview form, open-ended questions such as "What does a leader administrator mean to you?" "What personal traits are they supposed to have?" were asked as general questions and the questions were divided into sub-sections according to the explanations from the participants and thus the attitudes and characteristics of the leader administrator were analyzed in detail. After the interview form was examined by faculty members who were experts in the field of education management, the necessary revisions were made, and it was administered to 3 participants outside the research group for the pilot study, and the items on the form were found to be comprehensible. After the preliminary application, the interview form was finalized.

The data were collected through individual interviews with the teachers working in 5 elementary schools, 4 secondary schools and 4 high schools in Bolu in October during 2020-2021 academic year and transcribed the interview form. Interviews were conducted at lunch times and at the end of the lessons without disrupting the course activities of the teachers. Interviews made with teachers over 30 days lasted 4 minutes on average and 12 hours in total. This research was examined in the Ethics Committee on Human Research in Social Sciences at Bolu Abant Izzet Baysal University and was found to be ethically appropriate.

Data Analysis

The data were analyzed using the descriptive analysis method. The output obtained as a result of descriptive analysis are organized within the scope of the themes revealed by the research questions and direct citation are included in order to reflect the views of the interviewed participants clearly (Yıldırım & Şimşek, 2015). Before the coding, the data were analyzed. After that, codes were created based on the words and phrases that were crucial for the purpose of the research. Codes are categorized based on their relationships among each other. At this point, themes were categorized into sub-sections meaningfully in the emerging categories. The codes of teacher opinions about leader administrator were categorized into their similar characteristics and themes. As subjecting them into a deeper process, the data analyzed through the opinions obtained from the teachers were presented in sub-categories which could not be noticed in descriptive analysis in a way that the reader could understand by bringing similar concepts together. The frequency of the codes that make up the themes is indicated in the parenthesis. Participant opinions are supported by direct citations. The findings obtained have been explained and interpreted accordingly (Maxwell, 1996).

Reliability in qualitative research is associated with consistency of research processes. In qualitative research, clear and understandable questions, consistency between codings, determining the role of the researcher are the issues aimed at ensuring reliability (Miles & Huberman, 1994). In this sense, the external realibility of the data was increased by detailed explanations about the role of the researcher, the teachers who are the data source in this research, the conceptual framework used in data analysis and all the processes followed. In order to increase the internal reliability of the research data, data analysis was carried out depending on the predetermined and detailed conceptual and theoretical framework. The sub-categories obtained by bringing similar concepts and the codes related to these sub-themes together were examined by two faculty members who are experts in education management and measurement evaluation within the scope of their validity studies, and the appropriateness of sub-categories and codings of the themes were checked by comparison. In the analysis, interview forms were given sequence numbers and these sequence numbers were used in the citations. Miles and Huberman's (1994) Reliability = Consensus/Consensus + Dissensus X 100 formula was used in the study. The consistency rate of the analyses was calculated as 89%. Since the consistency percentage of 70% and over is considered sufficient, reliability was achieved in the analysis. In qualitative research, internal validity is related to whether the findings obtained are
significant or not and their reliability transferable to other external current situations or appropriateness (Miles & Huberman, 1994). The integrity and consistency of the findings were constantly reviewed by the researcher to increase the internal validity of the research data. Interview schedule was adjusted accordingly to ensure long-term interaction in interviews with teachers. Expert faculty members on the subject of research were requested to examine the research in various dimensions. In order to increase the external validity of qualitative data, the preparation of the interview form, the collection of data and the processes were explained in detail. In addition, sub-categories and codes were clearly presented.

**FINDINGS**

In this section, the findings of the teachers' opinions on the concept of a leader administrator are presented in a table. In this context, teachers' views on the concept of a leader administrator are shown in Table 1.

**Table 1. Teachers' views about leader administrator**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethical</td>
<td></td>
<td>133</td>
</tr>
<tr>
<td>Facilitating</td>
<td></td>
<td>98</td>
</tr>
<tr>
<td>Innovative</td>
<td></td>
<td>82</td>
</tr>
<tr>
<td>Motivating</td>
<td></td>
<td>79</td>
</tr>
<tr>
<td>Instructive</td>
<td></td>
<td>70</td>
</tr>
<tr>
<td>Empowering</td>
<td></td>
<td>67</td>
</tr>
<tr>
<td>Visionary</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>Supportive</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

According to Table 1, teachers considered the leader administrator as ethical, facilitating, innovative, motivating, instructive, empowering, visionary and supportive.

Teachers' views on the concept of a ethical leader administrator are shown in Table 2.

**Table 2. Teachers' views about ethical leader administrator**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being neutral</td>
<td></td>
<td>19</td>
</tr>
<tr>
<td>Being reliable</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Being empathetic and fair</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Being prudent</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Being constructiveness</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Being equal to all</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Being patient</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Being courageous</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Being democratic</td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

According to Table 2, teachers expressed the leader administrator as a neutral (f=19), reliable (f=17), empathetic and fair (f=17), prudent (f=16), constructive (f=15), equal to all (f=14), patient (f=12), courageous (f=12) and democratic (f=12) under the category of ethical. Some of the views of teachers on the ethical leader administrator category are as follows:

"Leader management means being solution-oriented, fair and equal to all." (T29), "School administrator is a leader administrator who performs his official work neutrally. Namely, a teacher would be chosen for representing the school in an event and if the administrator suggests that a teacher that is close to him would join it, he can't be a leader administrator. In such a case, he has only fulfilled officially what he is asked to do." (T60), "The leader administrator must be reliable. An unreliable administrator cannot lead teachers." (T123), "I think the leader administrator should be fair. School administrators cannot be a leader administrators if they are not fair in rewarding teachers, arranging weekly schedules, distribution of duties, etc. If the administrator becomes fair in
performing these official procedures, he can be the leader administrator." (T98), "The leader administrator must be patient. He should wait for the work to be completed patiently. School administrators must do the work that the supreme institutions requested to do with patience, by displaying ethical behavior without offending anyone. Only then can they be the leader administrator." (T152).

Teachers' views on the concept of a facilitator leader administrator are shown in Table 2.

Table 3. Teachers' views about facilitator leader administrator

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining the goals and objectives</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Preparing environments for solving problems</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Being open to different solutions</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Supporting learning</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Collaborating to achieve goals and objectives</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Creating teams for activities</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Working to improve jobs and functioning</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Ensuring employees with autonomy and self-control</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Ensuring employees to express their opinions</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Being accessible</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

When the Table 3 is examined, it is seen that teachers consider the qualities of a leader administrator as being facilitator, guiding in setting goals and objectives (f=16), setting the environment for solving problems (f=15), being open to different solutions (f=12), supporting learning (f=11), collaborating to achieve goals and objectives (f=11), creating teams for activities (f=10), working to improve jobs and functioning (f=9), ensuring employees autonomy and self-control in their jobs (f=8). Furthermore, it has been suggested that there should be qualities such as ensuring that employees express their opinions (f=4) and being accessible (f=2). Some of the teachers' views about the facilitating theme of the leader administrator are presented below as citation:

"The leader administrator should guide teachers in determining the school's goals and objectives." (T42), "Instead of magnifying problems, the leader administrator provides the appropriate environment for solving problems." (T162), "The leader administrator is the administrator who helps teachers learn as the primary source of learning." (T144), "The leader administrator must achieve the objectives of the school and ensure teachers' collaboration." (T136), "The leader administrator should create teams and ensure activities to be easier instead of conducting them only by certain teachers." (T170), "The leader should be able to ensure that teachers are autonomous while doing their jobs, and support teachers about making their own decisions in terms of teaching process." (T81), "The leader administrator is the administrator who is accessible in his room when asked. It's hard for me to reach my school administrator. The door is closed most of the time." (T121).

Teachers' views on the concept of a innovator leader administrator are shown in Table 4.

Table 4. Teachers' views about innovator leader administrator

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being receptive</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Being innovator</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Creating new ideas</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Taking risks</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Supporting new ideas</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
According to the opinions of the teachers’ in Table 4, the characteristics that should be present in the leader administrator under the category of innovator: receptive (f=21), innovator (f=20), creating new ideas (f=18), risk taker (f=14), and supporting new ideas (f=9). Some of the teachers’ views about the innovator leader administrator are presented below in the form of citation:

"The leader administrator is supposed to be receptive while performing routine work." (T145), "They should be innovators. They should welcome change. They are supposed to ensure that the school can keep up with the change." (T99), "The leader administrator is a risk taker. Administrators should sometimes be able to show leadership behavior by taking risks." (T85), "The leader administrator should not only implement the official requirements, but also come up with new ideas and support new ideas." (T108), "Leader administrator is an innovator who brings a different concept to the educational environment and who gets the ideas of the people he works with in all processes (T26)".

Teachers’ views on the concept of a motivator leader administrator are shown in Table 5.

Table 5. Teachers’ views about motivator leader administrator

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivating</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Inspiring</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Activating</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Directing and supporting</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Being a source of inspiration</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Determining and achieving the goals</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

According to Table 5 teachers expressed the leader administrator as someone with the ability to motivate (f=16), inspire (f=15), activate (f=14), direct and support (f=13), become a source of inspiration (f=11), determine and achieve goals (f=10) under the theme of the motivator. Some of the teachers’ views about the motivator leader administrator are presented below in the form of citation:

"The leader should motivate teachers to perform their work. He should be able to increase teachers’ motivation to carry out extra roles as well as supervising them about official duties. For example, it is the leader administrator who can create a project on behalf of the school by motivating teachers." (T155), "In addition to his official authority, leader is a person who inspires teachers and enables them to work." (T88), "The leader administrator is the one who inspires and sets goals for school employees and manages to mobilize all school employees to achieve these goals. Otherwise, the employees wouldn’t perform something else except their work and the school would just continue to function normally." (T132), "A leader administrator is supposed to direct teachers and ensure that the activities are carried out with great enthusiasm." (T55).

Teachers’ views on the concept of a instructor leader administrator are shown in Table 6.

Table 6. Teachers’ views about instructor leader administrator

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor</td>
<td>Guiding teachers and students</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Creating a positive &amp; organized teaching-learning environment</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Promoting learning</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Supporting professional development</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Effective management of the educational process</td>
<td>6</td>
</tr>
</tbody>
</table>
Based on the teachers’ opinions in Table 6, the characteristics of the leader administrator under the category of instructor; guiding teachers and students (f=24), creating a positive and organized teaching-learning environment (f=18), promoting learning (f=12), supporting professional development (f=10) and effective management of the educational process (f=6). Some of the teachers’ views about the instructor leader administrator are presented below in the form of citation:

"The leader administrator should be able to guide teachers and students. He is supposed to have background information not only to guide teacher in educational issues, but also the students in terms of learning and development." (T100), "............ If there are no factors that adversely affect teaching and learning at a school, and there is a convenient environment to improve teaching and learning, which is provided by administrator, it is evident that this administrator is a leader administrator." (T139), "Administrator leader is a person who strives for the school to be a learning institution, encourages learning and participation of teachers in congresses, workshops, etc. for their professional development." (T35).

Teachers' views on the concept of an empowering leader administrator are shown in Table 7.

Table 7. Teachers' views about empowering leader administrator

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empowering</td>
<td>Motivating</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Contributing to professional development</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Participation in taking decision</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Transferring the authority</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Providing autonomy</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Accountability</td>
<td>3</td>
</tr>
</tbody>
</table>

According to the opinions of the teachers’ in Table 7, the characteristics that should be present in the leader administrator under the category of empowering; motivation (f=18), supporting professional development (f=16), participation in taking decision (f=13), transferring authority (f=11), providing autonomy (f=6), and accountability (f=3). Some of the teachers’ views about the empowering leader administrator are presented below in the form of citation:

"It is the official duty of teachers to attend class. However, if school administrators motivate teachers as a leader administrator about attending the class, teachers will make more efforts in their classrooms." (T137), "The leader is the person who supports the professional development of teachers by being an expert in the area." (T108), "...... If the administrator allows teachers to participate in decision making processes, he can become a leader administrator. A administrator who takes decision individually and says that this decision will be implemented cannot be expected to be a leader administrator." (T68), "The leader is the one who can transfer some of his authority to the teachers by relying on them." (T86), "Along with ensuring that the teachers perform their duties within the framework of official requirements, a leader administrator is the person who can provide autonomy to the teachers in their decision making processes about the work they perform in the classroom" (T126).

Teachers' views on the concept of a visionary leader administrator are shown in Table 8.

Table 8. Teachers' views about visionary leader administrator

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visionary</td>
<td>Forseeing the future</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Creating vision and directing it</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Analyzing event</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Improving the institution</td>
<td>11</td>
</tr>
</tbody>
</table>

According to Table 8 under the visionary theme of the leader administrators were found to be someone who foresees the future (f=22), creates vision and directs it (f=21), analyzes events (f=12)
and improves the institution (f=11). Some of the teachers' views about the visionary leader administrator are presented below in the form of citation:

"If the administrator prepares the school for the future, he is the leader administrator." (T1), "The person who creates a vision about the school and directs this to the teachers can be the leader administrator." (T156), "...He is the one who prepares the school for the future according to the changes and developments by keeping up with the changes and developments in the world." (T50), "It is the leader administrator who enhances the development of the school." (T29).

Teachers' views on the concept of a supportive leader administrator are shown in Table 9.

Table 9. Teachers' views about supportive leader administrator

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supportive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appreciating</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Assisting</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Providing resources</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Making decisions collaboratively</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Providing emotional support</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

According to Table 9 teachers expressed the leader administrator as someone who appreciates (f=15), assists (f=14), provides resources (f=13), makes decisions collaboratively (f=10), and provides emotional support (f=8). Some of the teachers' views about the supporting leader administrator are presented below in the form of citation:

"School administrators are the leader administrators who they appreciate teachers for what they've performed. This is a support for the teacher." (T12), "It is clearly stated in the regulations that teachers can receive documents such as certificate of achievement or certificate of excellence. Apart from these, the leader administrator is a person who appreciates teachers orally and with his attitudes." (T87), "The leader administrator is a person who supports teachers by striving to provide resources such as materials they need, etc." (Ö96), "The leader administrators are also supposed to make decisions collaboratively by caring about teachers' opinions." (T77), "If the administrator makes me feel precious, he is the leader administrator for me." (T12), "A leader administrator is someone who is frank, honest, affectionate to students and employees." (T152).

RESULTS, DISCUSSION AND RECOMMENDATIONS

The result of the research put forward the characteristics of the leader administrator according to the opinions of the teachers.

According to the research, the leader administrator is the one who is ethical, facilitating, empowering, instructive, innovative, visionary, motivator and supportive. The results also show that teachers expect school administrators to be ethical, facilitating, empowering, instructive, innovative, motivating, supportive and visionary. Schools, a social unit, are the institutions that need to be renewed continuously according to the changes and developments in terms of their structure, aims and performance (Şişman, 2011). The leadership of the school administrator is considered as an important factor for change to be carried out. The school administrator who will carry out the change effectively is expected to be innovative, empowering, facilitating, motivating, instructive, ethical and visionary leader, along with the fact that the presence of a leader is necessary to change school, explore problems, create a new vision (Fullen, 2007; Liu, 2013). Because of the incompetency of the traditional and authoritarian management style to make schools effective requires administrators to have different skills and characteristics today, the ethical, facilitating, empowering, instructive, innovative, motivating and visionary characters of the school administrators as leaders are important in terms of making themselves and the schools more successful. Similarly, Çelik (2001) stated that the quality of education can only be improved by the leadership abilities of school administrators, while Kark (2004) attributed school success to the leadership of administrators.
School administrators should carry out ethical personality traits that are impartial, reliable, prudent, understanding, fair, courageous and democratic as well as being a leader who will carry out the change. The incompetency of ethical leadership character of administrators is one of the most important problems faced by institutions because it leads to an unfair, partial and unreliable school culture and atmosphere (Monahan, 2012). School administrators are expected to fulfill their duties within the framework of laws and policies, as well as to comply with professional ethics principles (Pehlivan, 2001). In the globalized world, where democracy became more important in the early 21st century, ethical values began to gain importance in education management. To this end, school administrators are required to carry out their studies within the framework of democratic values and universal ethical principles. Considering the importance of value judgments in determining and carrying out educational objectives, the importance of the school administrators of our age acting in accordance with ethical principles occupies an important place. Therefore, school administrators who want to meet the necessities of the time should strive to increase the level of success of all students by acting honestly, fairly and morally as an ethical leader administrator (Akbaba & Sarıkaya, 2017). In addition, it is an undesirable behavior that negatively affects teamwork and cooperation, which are very important for schools today. Because of the fact that the undemocratic administrator does not count in his/her employees at the decision-making processes and does not give them a chance to express themselves freely, their participation in the activities will be low. In this framework, the ethical behavior of the administrators will reduce the problems in the school as well as making it easier for them to overcome the problems experienced. Considering that schools are institutions where moral and ethical values are prioritized and human relations are intensely experienced, it should be remembered that administrators should first exhibit ethical personal traits themselves in order to create a convenient school culture and atmosphere. They should be role-models for teachers, students and other stakeholders of the school with these characters.

Characters of the facilitating leader administrator according to teachers are guiding in determining goals and objectives, preparing environments for solving problems, assisting to learn and being open to solutions, collaborating to achieve goals and objectives, creating teams for activities, striving to improve jobs and functioning, providing employees with autonomy and self-control in their work, ensuring employees' opinions and being accessible. The leader administrator should be able to guide teachers in determining the objectives and goals of schools. However, in order to achieve this and guide teachers in setting goals, the administrator must be an expert. In solving problems encountered in schools, an administrator who is open to teachers' solutions can allow the problem to be solved more easily because teachers are practitioners at school and they can come up with more practical solutions to solve problems. Schools are social institutions where communication is required, so by being open to new ideas or solutions school administrators will contribute significantly to the functioning of the school.

Many activities carried out at schools are practices that require teamwork and cooperation. Therefore, school administrators should be able to form teams at schools by ensuring that activities are performed effectively and efficiently with cooperation and team spirit. The school administrators providing autonomy to the teachers while doing their jobs will contribute to them and increase students’ success by enabling them to be more effective in educational practices. In addition, since the autonomous behavior of teachers contributes positively to education, teachers should be provided with the opportunity to use new methods and techniques, to take into account the needs of their students, to be able to make their own decisions in teaching and to implement these decisions. If teachers are allowed to join in decision-making processes, they can also be more willing and efficient to implement the decision. Teachers should be able to make individual decisions in the classroom and apply their own approaches. Thus, teachers will get more connected to their professions, their level of motivation will increase and they perform their job with great passion (Ertürk, 2020).

The facilitating leader administrator, who creates high-performing teams and maintains their existence and functioning, must have features such as transfer of authority, collaboration, creativity, transparency, feedback and development (Bens, 2007). As leader administrators, they strive to prepare an environment where employees can accomplish their duties with a strong personal activity thanks to
their facilitating roles as school administrators. In accordance with the characteristics of the school, facilitating school administrators must facilitate things, eliminate difficulties and keep morale high (Töremen & Karakuş, 2008). This makes it necessary for school administrators to become facilitating lead administrators. Facilitating leaders provide employees with the necessary resources while doing their jobs, train them to perform their duties individually, try to create an institutional culture, agreeable for common purpose where there is sustainable learning, cooperation and close relations among employees (Töremen, 2004). Facilitating leader administrators try to create a common vision by helping all stakeholders of the school and meeting with them and authorizing them (Lashway, 1997; Aytaç, 2000). Facilitating leaders form and coordinate their teams with the spirit of cooperation and care about cooperation and participation (Quigley, 1998). Facilitating leadership roles involve consistency, collaboration, developing a common vision, adapting to change, training staff, facilitating learning, planning, motivating, developing trust and value management. The concept of facilitating leadership, based on supporting and empowering those who work, aims at improving employees’ self-confident and their participation in decisions. Facilitating leaders provide the necessary resources for employees, improve communications, and try to create institutional culture with their supporting and problem-solving skills (Randolph, 2000). As a result, the facilitating leader administrator is the one who collaborates with the teachers to facilitate all the work at school. In this context, it can be stated that the results obtained in this research are in line with pervious the literature.

Administrators who are innovative, receptive, who come up with new ideas and who can take risks, have innovative leader characters. In today’s technology and innovation period, it is easier for school administrators to focus on innovation and come up with new ideas. They should care about these ideas to make it easier for schools to adapt to these changes and innovation because when schools do not adapt to the changes and innovations, educational activities are negatively affected and the students fall behind the characteristics of the age and society. The changing needs of the society in the 21st century, rapidly-developing science and technology require institutions to focus on innovation. Therefore, it is essential for schools to have innovative leader administrators in order to benefit from innovations and adapt to them. As institution leaders, school administrators play a key role in building innovation management skills because innovative leader administrators create and manage the culture that promotes innovation in the institution by managing resources and energy, empowering and legitimising to innovative actions (Jaskyte, 2004), playing an active role in developing and supporting innovation, specifying the vision of innovation in the institution with clear goals and spreading innovation practices to all levels of the institution (Cormican & O’Sullivan, 2004; Patterson, Kerrin & Ghetto-Roisssard, 2009). In order to create innovation and development based on institutional creativity and learning skills at schools and to make it permanent, it is necessary to have innovative institutional culture at schools, leaders who perceive the importance of innovation and employees who consider innovation as the most important principal of their profession (Gülşen & Gökyer, 2010). The ability of school administrators to create innovative school culture and atmosphere will both increase the capacity of innovation in the institution and contribute to all employees supporting innovation by bringing new skills and knowledge at schools related to the innovation process (Bülbul, 2012). The innovative culture and atmosphere created at schools will affect the interactions and performance of all employees because the climate of innovative institutions that promote creativity is the first mechanism in which innovative behavior can develop (Chou, Shen, Hsiao & Chen, 2010). Innovative leader administrators at schools will create innovative school culture and teachers who have adopted the concept of innovation. Moreover, as a leader administrator, it has become a necessity in the 21st century for school administrators to improve themselves, to follow innovations in their fields and to be innovative to meet the expectations of the community from schools. With the rapid changing and developing of science and technology, it is necessary for schools, which are the most important educational institution, to be innovative and educate students in accordance with the age.

Motivating administrators are people with the ability and characters to motivate, inspire, activate, guide and support, aim and achieve success. These characteristics of them are very important to get efficient results obtained by motivating, inspiring and directing teachers and improving their performance. The school administrator can make the school successful, but he cannot achieve it on his
own. Teachers must also be included in the process as a team. They are required to be motivated effectively to form a team, and guided by the administrator. Motivating leaders use different means of inspiring patterns rather than using authority to achieve goals, and leaders and employees get involved in a high level of motivation activities (Burns, 1978). These practices include bonus as prize, appreciation, praise, value, participating decision making processes such as psychosocial development, promoting, communication, institutional and administrative tools that include justice (Yalcın & Korkmaz, 2013). In addition, leaders are supposed to motivate their employees to achieve much more than their potential. In order to achieve that, they should focus on teachers’ individual needs and development, so that they can develop their own leadership potential (Bass & Riggio, 2006). This is possible if the leader gets to know the employees closely and guides them in line with their expectations, directs and motivates them. It is clearly seen that the results obtained in the research support the related literature. For this reason, school administrators should set the goals for school together with the employees and inspire the employees to achieve them. When the administrator increases his employees’ motivation, it will be easier for him to direct and inspire them. In addition, transferring the authority of administrators to employees will reveal their leadership skills, which is a motivator itself. In order for teachers to carry out these tasks collaboratively at schools where team work is mandatory, school administrators are required to motivate and activate teachers as leader administrators. In order to form a convenient school atmosphere and culture, the school administrator must act with the teachers and be able to take risks when necessary.

According to teacher opinions, the role of instructional leader involves guidance for teachers and students, creating a positive and organized teaching-learning environment, creating and sharing the objectives of the school, promoting learning, supporting professional development and managing the educational processes effectively. Schools are the most important institutions for the development of society because the generations that will be raised at schools will participate in production and contribute to the development of society by working in different places in the future. However, in this process, along with the educational and professional requirements of teachers and students at schools, psychological and social requirements can also arise. Therefore, as a leader administrator, school administrators should have enough capacity to guide teachers and students at school, support the professional development of teachers, and strive to create a positive teaching and learning environment. Moreover, he should encourage teachers and students to learn, he should be a role model for them and participate in courses, seminars, workshops and congresses related to his field and continue postgraduate education, have educational journals at school and read them. He should also encourage teachers about their participation in every event that contributes to their professional development. As a leader administrator, he should manage the education processes effectively and ensure that they are practiced efficiency. He should identify the problems and deficiencies encountered in this process and act together with all stakeholders and solve the problems, and complete the deficiencies.

Instructional leadership roles of administrators are the basic requirement for school success (Hallinger, 2005). What distinguishes educational leadership from all other leadership approaches is its being unique to educational institutions (Kiş & Konan, 2014). It focuses on educational leadership, which is the attitude of the school administrator to achieve the goals of the student and what needs to be done with them by affecting other stakeholders, practices such as explaining the school’s goal, managing the teaching system and education, creating a positive school atmosphere, and tasks related to these issues (Buluç, 2009). Teaching leadership is different from other types of leadership, requiring direct interest in students, teachers, the curriculum and teaching-learning processes. As an instructive leader administrator, it is the job of school administrators to use their knowledge and skills to create a convenient teaching learning environment for students and teachers (Çelik, 2015) and to create an effective school for stakeholders to use their capacities (Smith & Andrews, 1989 in Özdoğan, 2020). Therefore, a positive teaching learning environment created at schools and all stakeholders using their capacities will increase the performance of teachers as well as the success of students and school. However, as a teaching leader, administrators must be an expert in different fields such as learning approaches, assessment and evaluation and classroom management in order to perform these tasks. Leaders with high levels of knowledge and skills could help teachers and students in school (Erdoğan,
The responsibility of an education leader is to ensure the implementation of the curriculum by focusing on teaching and learning at school, to provide that stakeholders contribute to the implementation of school goals, and to give responsibilities to stakeholders that will result in success. Administrators should be able to create an appropriate school environment, interact with teachers and provide that teachers train students for the purposes of the school in order to develop students in all aspects by keeping up with innovations (Gökyer, 2010). As a leader administrator, school administrators should create a friendly and reliable school atmosphere in which all teachers work willingly. For students to obtain a good education, they must meet these conditions (Kaya, 2008). They should also support teachers in all conditions (May & Spovitz, 2011) by providing them an opportunity to improve themselves (Leithwood, 2016). In this context, it can be stated that the results obtained in this research are in line with educational characteristic of leaders in the literature. Therefore, in the 21st century, school administrators should be able to create a convenient teaching learning environment at schools by guiding teachers and students. In addition to their official duties, they should encourage teachers and students to make the school a learning institution and support the professional development of teachers. An administrator who could not meet the needs of teachers and students, who could not create a positive teacher learning environment and who could not contribute to the professional development of teachers possibly could not achieve success at school. For this reason, school administrators should have enough time to perform these practices because most school administrators spend time on dealing with bureaucratic requirements rather than performing school practices. As a matter of fact, Özdoğru (2020) also emphasized that the bureaucratic workload of school administrators must be reduced.

According to teacher opinions, the role of empowering leader involves the qualities of motivating, contributing to professional development, participating in decisions, transferring authority, providing autonomy and being accountable. Teachers are responsible for performing official duties under existing laws and policies. However, if teachers’ motivation levels are increased by their administrators while performing these tasks, they might be more effective and efficient, make more efforts, and thus the success of both students and the school increase. Teachers also need up-to-date professional knowledge, skills, methods and techniques. Leader administrators can also support teachers by contributing to their professional development when necessary. Teachers’ participation in decision making processes is also important for supporting them because if they participate in these processes they will be more willing to take responsibilities in practicing. On the other hand, if the school administrators take the decision individually and ask the teachers to implement these decisions, both efficiency of the teachers will decrease and the success of the practices will not be at the desired level. Although most practices at schools are the implementation of central decisions, school administrators should ensure that teachers participate in decision-making processes and be autonomous in their work, especially in educational studies. Thus, as the leader administrators, they will both implement the decisions taken by the supreme institution and provide that projects, activities and activities will be carried out in accordance with the characteristics of the students and teachers by participating them in decision making processes and giving them autonomy on a school basis and thus meet the needs of the school and society. Along with implementing the official procedure, the leader administrator must be able to meet the needs and expectations of students, schools and society by strengthening teachers. As the empowering leader administrator, school administrators will also empower teachers by offering them an opportunity to question decisions and providing them feedback about the practices at the school and the functioning of the school. By doing so, they will not only increase teachers’ levels of happiness but also their occupational satisfaction and productivity (Aktaş, 2008). Empowering leaders implement reinforcing strategies on new, creative and autonomous work by ensuring that the institution displays effective performance (Çavuş, 2006). Empowering leaders are the ones who empower the employees in a realistic and dynamic style by providing authority, responsibility in a visible and consistent manner, (Bodner, 2005).

According to research, the role of a visionary leader involves foreseeing the future, creating vision and directing it to the employees, analyzing the events and improving the institution. Every school with specific goals has a road map to achieve these goals. The vision of the school administrator is important in achieving these goals because the school administrator could determine
the point that the school wants to reach and inform teachers, students and other school stakeholders about this, so that he could motivate them. The role of the leader is to create vision and effectively spread it by setting clear goals (Cormican & Sullivan, 2004). Şişman and Turan (2002) supported the results of this research and stated that leadership is a process that involves foreseeing the future and setting realistic goals and creating vision for the future of the institution thanks to leader administrator’s motivating skills in achieving the goals and creating a vision. Similarly, Erdoğan (2006) stated that it is important to set future goals and express them to employees in order to inspire and activate employees. As a matter of fact, school management no longer means implementing legislation and maintaining the authority or taking on the role of traditional and autocratic administrator; but taking on new roles about globalization, information technology, scientific attitudes and characters, instutional learning and total quality management (Göl & Bülbül, 2012). The administrator is obliged to create the school atmosphere accordingly by determining the mission and vision of his school, improving the cooperation environment and understanding the management of the school, and also designing how to apply them (Okutan, 2003). A school administrator should foresee the future, create a vision accordingly (Yıldız & Ertürk, 2019), share the vision with the teachers and create a school atmosphere to achieve this.

In the research; appreciation, assisting, providing resources, making decision collaboratively and providing emotional support are identified as the characters of a supportive leader. Teachers expect to be appreciated. When they are appreciated, this increases their motivation and they can be more diligent in their work. It is crucial for school administrators to support the practices at school and to make the decisions collaboratively with the teachers in terms of the efficiency of work because it is easier for teachers who participate in the decision making processes to adopt and implement the decisions made. Similarly, Göksoy (2014) stated that an administrator can be considered as successful if he can participate in the decision making processes conveniently in a school environment. It is essential for him to participate in these processes in order to achieve the goals by motivating teachers and increasing their performance (Delice & Gül, 2012). By doing so, the supporting characteristics of school administrators will also make it easier for them to be perceived as leader administrators. Teachers may also need material and emotional support while performing educational practices. Along with providing resources such as material to use in the classroom, for instance, teachers expect a school administrator to be frank and honest, in a way that makes them feel like he trusts and cares about them. All things considered, as a supportive leader administrator, school administrators should support teachers both in providing materials and giving them emotional support. As a matter of fact, Littrell, Billingsley and Cross (1994 in Savaş, 2016) also indicated that administrators should appreciate the practices performed by teachers, make teachers feel that they are valued members of the school, take their opinions into account, and provide them with necessary materials and resources to carry out effective teaching practices. Teachers supported by school administrators adopt the school's objectives more, and their feelings of commitment to the school increase (Şama & Kolamaz, 2011). In this context, the efforts of school administrators as supportive leader to support teachers constantly will ensure their performing more effectively and diligently.

According to research, the role of leader administrators involve: having ethical leadership characteristics consisting of fair and reliable attitudes at an equal distance to everyone, contributing to the professional development of teachers, creating an appropriate intstitutional atmosphere for the convenient functioning of the educational process at school, guiding teachers and students, supporting them by increasing the motivation of teachers and other employees, acting with teachers by taking risks when necessary and displaying innovative and visionary characteristics. These characteristics will contribute to the development of school culture and the formation of a convenient school atmosphere. In order for school to improve its educational processes and quality of itself at an international level, it is required to provide a constant development which is only possible when school administrators display leader characteristics.

Based on the findigs of the study, the implications are as follows:

1-School administrators;
• An ethical leader administrator is supposed to be fair, reliable, constructive, patient, courageous, understanding, and democratic.

• A facilitating leader administrator is supposed to guide teachers in determining goals and objectives, create an environment for solving problems and be open to suggestions, help students and teachers learn and support their learning; ensure that activities and objectives are carried out collaboratively, aim to facilitate all work performed at school, provide the teacher with autonomy in their duties, and create a school atmosphere that allows teachers to express their views.

• An empowering leader administrator is supposed to increase teachers’ motivation, contribute to their professional development and support them, involve them in decision making processes, transfer authority when necessary and be accountable to teachers and all stakeholders during his duties.

• An instructor leader administrator is supposed to guide teachers and students, strive for positive and convenient teaching environments, support the professional development of teachers by promoting learning, identify mistakes and missing practices and prevent errors by managing the educational process effectively.

• An innovative leader administrator is supposed to be receptive, come up with new ideas an take risks when necessary.

• A leader administrator needs to be motivating to inspire, activate, guide and direct teachers. This can be possible with the sustainable professional development of administrators.

• A supportive leader administrators is supposed to appreciate teachers, help them, provide resources, make decisions collaboratively and support them emotionally.

• A visionary leader administrator is supposed to have the ability to create a vision, foresee the future and adopt practices that would increase school success.

2- In addition to their official roles, leader administrators benefit from their characters as facilitating, empowering, instructive, innovative, motivating and supportive which will ensure a convenient school atmosphere and culture as well as providing schools to be open to developments.

3- In order for school administrators to gain leadership managerial characteristics; Ethical leadership, visionary leadership, instructional leadership, facilitating and supportive leadership, innovation and change, teacher empowerment, and motivation can be given seminars, and they can participate in workshops, conferences and congresses related to these issues.

REFERENCES


Gökyer, N. (2010). Primary school principals’s levels of realizing instructional leadership roles and the factors limiting these roles. *Journal of Ahmet Keleşoğlu Education Faculty, 29*, 113-129.


Investigating Speaking Performance in Terms of Cultural Capital*

Onur Dölek
Ministry of National Education

Salih Küşad Dolunay
Bolu Abant İzzet Baysal University

Abstract

This study examines whether or not cultural capital has a predictive role in speaking performance. This is a mixed-methods study. Its data were collected from 263 participants (118 females, 145 males) of different ages and professions. The Cultural Capital Scale and a semi-structured interview form were used to collect the data. The participants’ speeches were videotaped and evaluated using the Speaking Performance Rating Scale. The study data were evaluated using correlation analysis (r), simple linear regression and content analysis. This study found a positive, significant relationship between cultural capital and speaking performance (r=0.878, p<0.001). Cultural capital accounted for 77.2% of the variation in speaking performance, thus significantly predicting speaking performance. Of the participants, 87.07% said that cultural capital affects speaking performance, and 94.29% said that there was parallelism between cultural capital competencies and speaking performance. Cultural capital plays a vital role in improving speaking performance. Cultural activities such as mobile movie theaters, sports facilities, libraries, theater performances and more should be made available to children who live in relatively underprivileged environments in order to increase their cultural capital. With long-term strategies and development policies, educational programs should be restructured to consider cultural capital’s role in linguistic skills. Online practices such as virtual visits to museums and exhibitions, participation in virtual concerts and e-books should be emphasized more. Courses that prioritize cultural content such as music, movies and novels should be designed. The content of textbooks should be enriched by including biographies of important scientists and artists. Researchers should also investigate whether or not cultural capital affects other fundamental linguistic skills.

Keywords: Speaking, Performance, Cultural Capital, Prediction.

DOI: 10.29329/ijpe.2022.426.16

* This article derives from a doctoral thesis, Investigating Speaking Performance in Terms of Cultural Capital, by Onur Dölek, written under the supervision of Salih Küşad Dolunay.

Onur Dölek, Dr., Turkish Teacher, Ministry of National Education, ORCID: 0000-0002-8816-2754

Correspondence: onur.dolek@hotmail.com

Salih Küşad Dolunay, Assist. Prof. Dr., Department of Turkish and Social Sciences Education, Education Faculty, Bolu Abant İzzet Baysal University, ORCID: 0000-0002-2931-405X
INTRODUCTION

The rapid increase in social interaction today has caused individuals to speak more. Speaking is the quickest way to completely and accurately communicate messages to individuals with whom we interact. Societies also judge individuals by the way they speak. Some are considered impolite, some kind. Some are thought to be knowledgeable and understanding, while others are deemed ignorant, and inconsiderate. Most of these evaluations are based on how the people in question speak. Speech is thus important, both as a means of communication and because of the way it is perceived by societies.

The effects of cultural structure determine speech characteristics such as pronunciation, fluency, content production and language competency. Culture is a system that emerges as a result of the organization of humans, emotions, behaviors and objects (Goodenough, 1961). Douglas (2004: 88) defines culture as the moral and intellectual spirit of specific organizations and their efforts to produce common meaning. Güvenç (1997) stresses that improving culture results in improved language. Therefore, with improvements in language, culture is developed and enriched. Similarly, Krauss and Chiu (1998: 42) argue that social behaviors form language. Mosiyenko (2014: 87) claims that language is a simple reflection of culture. All these points lead to the conclusion that culture and language are intertwined.

Bourdieu’s thoughts on culture and language are important. According to Jenkins (1992: 99), Bourdieu does not set culture apart from language and characterizes them as explanatory of each other. Speaking provides a rich source of impressions of speakers, according to Williams (1975, as cited in Krauss & Chiu, 1998). Kent and Burkand (1981) highlight that speakers’ age, gender, geographical origin and socioeconomic status can be determined by listening to their speech. Understanding and teaching language are closely related to individuals’ cultural level, experience and knowledge (Günay, 1995). Individuals develop behaviors and discourse that are appropriate to their cultural background.

The relevant literature uses some of these concepts interchangeably, perhaps due to culture’s broad range of meanings and its role in cultural capital. Indeed, in their descriptions of culture, Swidler (1986), Gans (2018: 21), Güngör (2018: 302) and Williams (1993: 10) include variables that are parts of cultural capital along with art, information, education and recreation.

Researchers have interpreted cultural capital in a variety of ways. Bourdieu (1986) defines cultural capital as educational competencies that children attained in their families or at school. Marshall (1999: 448) considers cultural capital to be a kind of socio-cultural background and experience that consists of a variety of linguistic and cultural abilities. Harker (1990) is of the opinion that cultural capital involves attitudes and tendencies that are closely associated with education. Swartz (1996) emphasizes that cultural capital involves a wide range of resources such as verbal ability, general cultural awareness, esthetic preferences, scientific knowledge and academic achievement. Dumais (2002) argues that cultural capital is grounded in individuals’ knowledge, linguistic competencies and linguistic behaviors. McTavish (2020) says that cultural capital plays a role in variables such as academic achievement, social conversation and business life. Cultural capital offers advantages such as being able to build a career or generate income (Lareau & Weininger, 2003; Lin, 1999). Cultural capital refers to participation in art, music and culture, according to DiMaggio (1982), and according to DiMaggio and Mohr (1985) and Roberts (2004), it also refers to participation in knowledge, activity and higher culture. When describing cultural capital, some studies (Dumais, 2002; Robinson & Garnier, 1985; Sullivan, 2001) consider language competency, interaction skills and linguistic skills as a common component (Dumais, 2002; Robinson & Garnier, 1985; Sullivan, 2001). Collins (1998) claims that cultural capital affects the content of actions, conversations and thoughts. Since descriptions of cultural capital commonly include verbal abilities, it can be concluded that some linguistic skills are determined by cultural capital.

Studies in the literature have investigated speaking skill (Ahmad & Rozimela, 2013; Atli & Bergil, 2012; Ayrancı, 2016; Başaran & Erdem, 2009; Bircan, 2013; Doğan, 2009; Erdem & Erdem, 2015; Hamzadayı & Dölek, 2017; Khameis, 2006; Kusnierek, 2015; Lourdunathan & Menon, 2006;
Sato, 2003; Uçgun, 2007; Vilimec, 2006). Other studies have investigated the effects of cultural capital on academic achievement (Andersen & Hansen, 2011; DiMaggio 1982; Gaddis, 2013; Jæger, 2011; Lareau, 1987; Lee & Bowen, 2006; Roscigno & Ainsworth-Darnell, 1999; Tramonte & Willms, 2010; Wildhagen, 2009; Yamamoto & Brinton, 2010; Yaşar, 2016). However, there are no studies of speaking performance that examine how it is determined by cultural capital. Determining the effects of cultural capital on speaking performance will contribute to students, teachers and program designers’ ability to promote speaking skills and create a basis for reflection, discussion and research on cultural capital and fundamental linguistic skills.

Each of the strategies, methods and techniques that are used to promote speaking skills affect speaking at different levels. Students who experience the same instruction in speech still end with varying levels of performance. This is true not only in student life, but afterward, too. This study aimed to determine whether or not individuals with different cultural capital levels differ and the roles of the variables of cultural capital in speaking performance. The study’s main research question was: Is cultural capital a significant predictor of speaking performance? Its sub-questions were:

1. Is there a significant relationship between cultural capital and speaking performance?
2. Are the intellectual accumulation, participation, cultural awareness and cultural potential sub-dimensions of cultural capital significant predictors of speaking performance?
3. Is cultural capital a significant predictor of the pronunciation, fluency, content, language competency, and non-verbal communication sub-dimensions of speaking skills?
4. What are participants’ views about whether or not cultural capital competency affects speaking skills?
5. How do participants evaluate their speaking skills along with their cultural capital competencies?

METHOD

Research Design

This is a mixed-methods study that combines qualitative and quantitative research techniques. Mixed-methods studies integrate quantitative and qualitative research into a single study (Johnson & Christensen, 2014: 430). This study has an explanatory sequential mixed-method design based on the use of qualitative data to explain quantitative findings in detail (Creswell, 2016: 224).

Correlation analysis, a non-experimental method, was used for the qualitative part of this study. Correlation analysis examines the relationships between one or more independent quantitative variables and one or more dependent quantitative variables (Johnson & Christensen, 2014: 44). This study used the prediction model, a relational research technique. In this model, the independent variable is the predictor, and the dependent variable is the predicted variable (Tekbıyık, 2014: 103). Interviews were used in the qualitative part of this study.

Research Sample

This study was carried with 263 participants in 12 different professions (118 females and 145 males). Their ages ranged from 20 to 65. In correlational studies, sample sizes of at least 30 are considered sufficient (Fraenkel, Hyun & Wallen, 2012; Gall, Gall & Borg, 2003). The participants’ professions were classified using the approach of the ISCO-08 (International Standard Classification of Occupations).
Research Instruments and Procedures

The Cultural Capital Scale was developed by Avcı and Yaşar (2014) to determine cultural capital competencies. Its reliability and validity study was conducted, and its internal consistency alpha coefficient was found to be 0.955. Factor analysis determined that its factors accounted for 63.79% of the variance in the dependent variable.

The author of this study developed a semi-structured interview form to determine the participants’ views about their cultural capital competencies and how these competencies are reflected in their speaking skills. The form consists of a single question. Experts were consulted for their advice about how to prepare the form.

The Speaking Performance Rating Scale was examined by 10 experts, and the content validity index (CVI) values of its scale items were determined. The items with CVI values of less than .90 were excluded from the scale. Kendall’s coefficient of concordance (W) was used to determine the scale’s reliability. Three experts evaluated 20 different speeches, and the W value was .954 where p<0.05. The scale has 22 items in five dimensions.

During data collection, the participants first filled out the Cultural Capital Scale and the semi-structured interview form. Later, they gave improvised speeches about one of a set of preselected issues. Their speeches were videotaped. No time limits were set for their speeches, which were evaluated using the Speaking Performance Rating Scale.

Data Analysis

This study used correlation analysis to determine the relationships between cultural capital and speaking performance. Simple linear regression analysis was used to determine cultural capital’s ability to predict speaking performance. The data obtained using the semi-structured interview form were analyzed using content analysis. IBM SPSS 21.0 (released 2012, IBM SPSS for Windows, Version 21.0, Armonk, NY: IBM Corp.) and MS-Excel 2007 software were used for the statistical analyses and calculations. This study’s threshold for statistical significance was p<0.05.

RESULTS

1. The results for the main research question and their interpretation

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>P</th>
<th>F</th>
<th>p</th>
<th>R</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Capital</td>
<td>0.606</td>
<td>0.020</td>
<td>29.689</td>
<td>&lt;0.001</td>
<td>881.422</td>
<td>&lt;0.001</td>
<td>0.878</td>
<td>0.772</td>
</tr>
<tr>
<td>Constant</td>
<td>13.552</td>
<td>1.965</td>
<td>6.896</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows that the regression model was statistically significant (F=881.422, p<0.001), that cultural capital accounted for 77.2% of the variance in speaking performance, and that cultural capital significantly predicted speaking performance (F=881.422, p<0.001). A one-unit change in cultural capital led to a 0.666-unit change in speaking performance.
2. The results for the first research sub-question and their interpretation

Table 2. The relationships between cultural capital and speaking performance

<table>
<thead>
<tr>
<th>Speaking Performance</th>
<th>Cultural capital</th>
<th>Intellectual Accumulation</th>
<th>Participation</th>
<th>Cultural Awareness</th>
<th>Cultural Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pronunciation</td>
<td>0.777</td>
<td>0.740</td>
<td>0.639</td>
<td>0.653</td>
<td>0.690</td>
</tr>
<tr>
<td>Fluency</td>
<td>0.829</td>
<td>0.799</td>
<td>0.688</td>
<td>0.679</td>
<td>0.723</td>
</tr>
<tr>
<td>Content</td>
<td>0.868</td>
<td>0.846</td>
<td>0.692</td>
<td>0.717</td>
<td>0.762</td>
</tr>
<tr>
<td>Language Competency</td>
<td>0.827</td>
<td>0.809</td>
<td>0.635</td>
<td>0.693</td>
<td>0.735</td>
</tr>
<tr>
<td>Non-Verbal Communication</td>
<td>0.644</td>
<td>0.627</td>
<td>0.501</td>
<td>0.536</td>
<td>0.577</td>
</tr>
</tbody>
</table>

*p=0.009, all other significances were p<0.001

As Table 2 shows, there was a high-level, linear, positive and statistically significant relationship between the individuals’ cultural capital competencies and speaking performance (r=0.878, *p=0.001*), based on the Pearson’s correlation coefficient levels suggested by Büyüköztürk (2014: 32). Among the sub-dimensions, the highest-level relationship was between content and intellectual accumulation (r=0.846, *p<0.001*).

3. The results for the second research sub-question and their interpretation

Table 3. The results of the regression analysis for the prediction of speaking performance by the sub-dimensions of cultural capital

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>R</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accumulation</td>
<td>1.164</td>
<td>0.045</td>
<td>26.050</td>
<td>&lt;0.001</td>
<td>678.583</td>
<td>&lt;0.001</td>
<td>0.850</td>
<td>0.722</td>
</tr>
<tr>
<td>Constant</td>
<td>22.670</td>
<td>1.897</td>
<td>11.948</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>2.079</td>
<td>0.129</td>
<td>16.158</td>
<td>&lt;0.001</td>
<td>261.066</td>
<td>&lt;0.001</td>
<td>0.707</td>
<td>0.500</td>
</tr>
<tr>
<td>Constant</td>
<td>28.900</td>
<td>2.648</td>
<td>10.914</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural Awareness</td>
<td>2.576</td>
<td>0.150</td>
<td>17.193</td>
<td>&lt;0.001</td>
<td>295.599</td>
<td>&lt;0.001</td>
<td>0.729</td>
<td>0.531</td>
</tr>
<tr>
<td>Constant</td>
<td>26.931</td>
<td>2.604</td>
<td>10.341</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural Potential</td>
<td>2.905</td>
<td>0.147</td>
<td>19.748</td>
<td>&lt;0.001</td>
<td>389.997</td>
<td>&lt;0.001</td>
<td>0.774</td>
<td>0.599</td>
</tr>
<tr>
<td>Constant</td>
<td>23.537</td>
<td>2.443</td>
<td>9.634</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As Table 3 shows, the regression models were statistically significant. According to the model, the intellectual accumulation sub-dimension of cultural capital accounted for 72.2% of the variance in speaking performance, the participation sub-dimension accounted for 50.9% of the variance in speaking performance, and the cultural awareness sub-dimension accounted for 53.1% of the variance in speaking performance. The cultural potential sub-dimension accounted for 59.9% of the variation in speaking performance. All these sub-dimensions of cultural capital significantly predicted speaking performance. A one-unit change in the intellectual accumulation sub-dimension led to 1.164 units change in speaking performance. A one-unit change in the participation sub-dimension led to 2.079 units change in speaking performance. A one-unit change in the cultural awareness sub-dimension led to 2.576 units change in speaking performance, and a one-unit change in the cultural potential sub-dimension led to 2.905 units change in speaking performance.
4. The results for the third research sub-question and their interpretation

Table 4. The results of the regression analysis for cultural capital’s prediction of the sub-dimensions of speaking performance

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>R</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Capital</td>
<td>0.149</td>
<td>0.007</td>
<td>19.949</td>
<td>&lt;0.001</td>
<td>397.955</td>
<td>&lt;0.001</td>
<td>0.777</td>
<td>0.604</td>
</tr>
<tr>
<td>Pronunciation</td>
<td>6.333</td>
<td>0.721</td>
<td>8.786</td>
<td>&lt;0.001</td>
<td>574.107</td>
<td>&lt;0.001</td>
<td>0.829</td>
<td>0.687</td>
</tr>
<tr>
<td>Cultural Capital</td>
<td>0.123</td>
<td>0.005</td>
<td>23.961</td>
<td>&lt;0.001</td>
<td>799.489</td>
<td>&lt;0.001</td>
<td>0.868</td>
<td>0.754</td>
</tr>
<tr>
<td>Fluency</td>
<td>3.054</td>
<td>0.495</td>
<td>6.165</td>
<td>&lt;0.001</td>
<td>565.043</td>
<td>&lt;0.001</td>
<td>0.827</td>
<td>0.683</td>
</tr>
<tr>
<td>Cultural Capital</td>
<td>0.220</td>
<td>0.008</td>
<td>28.725</td>
<td>&lt;0.001</td>
<td>184.580</td>
<td>&lt;0.001</td>
<td>0.644</td>
<td>0.414</td>
</tr>
<tr>
<td>Content</td>
<td>1.697</td>
<td>0.751</td>
<td>2.260</td>
<td>&lt;0.001</td>
<td>77.301</td>
<td>&lt;0.001</td>
<td>0.305</td>
<td>0.102</td>
</tr>
<tr>
<td>Language Competency</td>
<td>0.085</td>
<td>0.004</td>
<td>23.771</td>
<td>&lt;0.001</td>
<td>2.260</td>
<td>&lt;0.001</td>
<td>0.428</td>
<td>0.183</td>
</tr>
<tr>
<td>Non-verbal communication</td>
<td>0.028</td>
<td>0.002</td>
<td>13.586</td>
<td>&lt;0.001</td>
<td>18.260</td>
<td>&lt;0.001</td>
<td>0.690</td>
<td>0.414</td>
</tr>
</tbody>
</table>

As Table 4 shows, the regression models were statistically significant. Cultural capital accounted for 60.4% of the variance in the pronunciation sub-dimension of speaking performance, 68.7% of the variance in the fluency sub-dimension, and 75.4% of the variance in the content sub-dimension. It also accounted for 68.3% of the variance in the language competence sub-dimension and 41.4% of the variance in the non-verbal communication sub-dimension. Cultural capital significantly predicted these sub-dimensions of speaking performance. A one-unit change in cultural capital led to 0.149 units change in the pronunciation sub-dimension and 0.123 units change in the fluency sub-dimension. A one-unit change in cultural capital also led to 0.220 units change in the content sub-dimension, 0.085 units change in the language competence sub-dimension and 0.028 units change in the non-verbal communication sub-dimension.

5. The results for the fourth research sub-question and their interpretation

Table 5. The participants’ views about whether or not cultural capital competency affects speaking performance

<table>
<thead>
<tr>
<th>Views</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural capital competency affects speaking performance.</td>
<td>229</td>
<td>87.07</td>
</tr>
<tr>
<td>Cultural capital competency affects speaking performance, but is not sufficient on its own.</td>
<td>22</td>
<td>8.36</td>
</tr>
<tr>
<td>Cultural capital competency does not affect speaking performance.</td>
<td>12</td>
<td>4.56</td>
</tr>
<tr>
<td>TOTAL</td>
<td>263</td>
<td>100</td>
</tr>
</tbody>
</table>

As Table 5 shows, 87.07% of the participants said that cultural capital affects speaking performance, 8.36% said that cultural capital is not the only variable that affects speaking performance, and 4.56% said that cultural capital does not affect speaking performance.

6. The results for the fifth research sub-question and their interpretation

Table 6. The participants’ views about their speaking performance based on their cultural capital competencies

<table>
<thead>
<tr>
<th>Views</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a high level of cultural capital competency and can speak effectively.</td>
<td>88</td>
<td>33.46</td>
</tr>
<tr>
<td>I have a moderate level of cultural capital competency and speaking skills.</td>
<td>53</td>
<td>20.15</td>
</tr>
<tr>
<td>I have a low level of cultural capital competency and experience difficulties with speaking.</td>
<td>107</td>
<td>40.68</td>
</tr>
<tr>
<td>I have a low level of cultural capital competency, but can speak effectively.</td>
<td>9</td>
<td>3.42</td>
</tr>
<tr>
<td>I have a high level of cultural capital competency, but do not think that I speak effectively.</td>
<td>6</td>
<td>2.28</td>
</tr>
<tr>
<td>TOTAL</td>
<td>263</td>
<td>100</td>
</tr>
</tbody>
</table>
As Table 6 shows, 33.46% of the participants said that they had a high level of cultural capital competency and can speak effectively, 20.15% said that they had a moderate level of cultural capital competency and speaking skills, and 40.68% said that they had a low level of cultural capital competency and experience difficulties with speaking.

**DISCUSSION, CONCLUSION, RECOMMENDATIONS**

The results for this study’s main research question indicated that cultural capital accounts for 77.2% of the variance in speaking performance, and that cultural capital significantly predicts speaking performance. Of the participants, 87.07% said that cultural capital affects speaking performance, and 94.29% said that there was parallelism between cultural capital competencies and speaking performance. The relationship between cultural capital and speaking performance was found to be linear, positive, and statistically significant (r=0.878, p<0.001). Together, these findings lead to the conclusion that cultural capital competency plays an essential role in speaking performance. Indeed, Dumais (2002) says that individuals’ social tendencies and behaviors, including speech acts, are the results of their habits and cultural capital in specific fields. Janene, Nicola and Vicki (2013: 166) argue that previous experiences and sociocultural antecedents affect how individuals speak and what they say. McWhorter (2014) claims that language is the phenomenon that reflects one’s culture and worldview and that language is an indicator of cultural capital. Cultural capital can be thus seen as a system of indicators that affect speech and are reflected in it.

The results for this study’s second sub-question indicated that the intellectual accumulation sub-dimension of cultural capital accounted for 72.2% of the variance in speaking performance. The participation sub-dimension accounted for 50.0%, the cultural awareness sub-dimension accounted for 53.1%, and the cultural potential sub-dimension accounted for 59.9%. All these sub-dimensions of cultural capital significantly predicted speaking performance. The top two predictors of speaking performance were: intellectual accumulation (72.2%) and cultural potential (59.9%). Components such as being knowledgeable in a variety of disciplines, reading scientific journals or articles, being interested in literature, reading books regularly, going to the theater and/or the movies and visiting museums and/or historical places, which constitute intellectual accumulation and cultural potential, thus play an essential role in speaking performance. Heath (2012: 425-426) highlighted the role of knowledge and skills related to science and art, cultural capital variables, on language development and described the effects of art, science, and social and family heritage, which affect cultural capital, on individuals’ speaking tendencies and performance as inevitable. Similarly, Matarasso (1997) found that participation in art activities has positive effects in domains such as social adaptation, personal development and imagination. Speaking, here, is a medium for social adaptation.

The results for this study’s third sub-question indicated that cultural capital accounted for 60.4% of the variance in the pronunciation sub-dimension of speaking skill, 68.7% of the variance in the fluency sub-dimension and 75.4% of the variance in the content sub-dimension. It also accounted for 68.3% of the variance in the language competency sub-dimension and 41.4% of the variance in the non-verbal communication sub-dimension. Cultural capital significantly predicted these sub-dimensions of speaking skills. There was also a positive and statistically significant relationship between cultural capital and all the sub-dimensions of speaking skill, which indicates that cultural capital affects all the sub-dimensions of speaking skill. It is striking that cultural capital accounted for the highest percentage of variance in the content sub-dimension (75.4%), which also had the highest Pearson’s correlation coefficient (r=0.868). Cultural capital thus has a determinant effect on the components that constitute the content sub-dimension such as enriching the content of speech, featuring main ideas, addressing different aspects of the topic and speaking in a goal-oriented fashion without deviation. On the other hand, the highest relationship between the sub-dimensions of cultural capital and speaking skill was between intellectual accumulation and content (r=0.846). This finding indicates parallelism between reading habits and content production in speaking. Ugun (2007) stresses that people who lack a reading habit cannot be expected to give well-organized and articulate speeches. Marks (2009) says that reading, an explanatory component of cultural capital, plays a vital role in enlarging vocabulary, knowledge acquisition, gathering information and increasing
interpretative power. It is thus inevitable for reading, a strong predictor of cultural capital, to affect speaking performance through variables such as vocabulary and knowledge acquisition.

There is clearly a relationship between cultural capital and language skills. The theoretical background of Bourdieu’s approach indicates that cultural capital, cultural tendencies and linguistic skills are intertwined (Yaniklar, 2010). The ability to use language in specific forms is a criterion of cultural capital (Harrison, 2013). People who lack cultural capital are not able to connect with others, interact with them competently and are not taken seriously in some cases (Schwalbe et al., 2000). Also, children are born with the ability to learn language(s) and thus speaking skill, and this ability is largely at similar levels. Therefore, it may be incorrect to attribute variations or deficiencies in individual speaking performance to natural abilities.

Socioeconomic status is another essential determinant of cultural capital competency. Indeed, there is a positive, significant relationship between socioeconomic status and cultural capital competency (De Graaf, 1986; Nishioka & Durrani, 2019). For example, there are vital inequalities between children who are raised in families with different socioeconomic statuses. These inequalities increase over time and become deficiencies in linguistic skills (Fernald, Marchman & Weisleder, 2013). Roy, Chiat & Dodd (2014) say that children raised in socioeconomically disadvantaged families experience early language problems, and their speaking skills do not develop. Pace et al. (2017) found that socioeconomic status affects linguistic skills such as vocabulary, grammar, narration and phonetics. Many children from homes with low socioeconomic status are less able than their peers to use standard language and produce discourse (Ginsborg, 2006). Rowe (2008) argues that the children of more educated parents with more cultural capital benefit more from verbal opportunities while communicating with their parents than the children of less educated parents with less cultural capital, and this difference affects children’s speech development. More educated parents with high cultural capital talk more with their children, pay attention to lexical diversity and use long expressions (Rowe, 2008; Schwab & Lew-Williams, 2016). Cultural capital levels affect variables such as speaking and local language, as argued by Andersen and Hansen (2011). Bourdieu and Passeron (2015: 161) found that individuals with low cultural capital may make intonation mistakes while using standard language because they speak quickly and feel uncomfortable while speaking. Koytak (2012) stresses that individuals from families with relatively low cultural capital use local words and experience speech disfluency. Grenfell (2011: 80) says that individuals with professions that society regards as relatively high-level are more competent in word use and topic elaboration. Labov found that individuals from the lower strata of society frequently pause and repeat themselves and are indecisive in their speech (as cited in Grenfell, 2011: 80). Shaw (1951) observed that word use and manners of expression provide hints about speakers’ social strata based on cultural capital. Smedley and Bayton (1978) also thought that middle class people speak more accurately than the lower classes.

Cultural capital, which was first described by Bourdieu and Passeron (1977) in their theory of cultural and social reproduction, plays an active intermediary role in inequality in educational models. This study’s findings show that it plays a similar intermediary role in speaking performance, and that varying cultural capital competencies cause inequality in speaking performance.
It is important to increase cultural capital levels to enhance speaking performance. Cultural activities such as mobile movie theaters, sports facilities, libraries, theater performances and more should be made available to children who live in relatively underprivileged environments in order to increase their cultural capital. With long-term strategies and development policies, educational programs should be restructured to consider cultural capital’s role in linguistic skills. Online practices such as virtual visits to museums and exhibitions, participation in virtual concerts and e-books should be emphasized more. Courses that prioritize cultural content such as music, movies and novels should be designed. The content of textbooks should be enriched by including biographies of important scientists and artists. Researchers should also investigate whether or not cultural capital affects other fundamental linguistic skills.

**REFERENCES**


Analysis of the Pedagogical Content Knowledge Development of Prospective Teachers in the Lesson Plan Development Process: 4MAT Model*

Feyza Aliustağlou
Kastamonu University

Abdulkadir Tuna
Kastamonu University

Abstract

The aim of this study is to investigate the change of prospective mathematics teachers’ pedagogical content knowledge (PCK) on the linear equation and slope subject based on the lesson plan development and implementation process based on the 4MAT model. The concept of PCK was discussed in three components as content knowledge, knowledge of student understanding and knowledge of instructional strategies. The research was carried out based on mixed research methods. The data collection tools consisted of 48 lesson plans developed by prospective teachers in three stages and observation notes taken based on the teachings they did. The lesson plans developed by prospective teachers were analyzed quantitatively using the rubric developed by the researcher. Whether there is a statistically significant difference in PCK components in the lesson plans was analyzed by using appropriate tests. In addition, various qualitative sections from the lesson plans showing the development of prospective teachers were presented. As a result of the research, it was concluded that prospective teachers showed improvement in each of the components of the PCK at the end of the lesson plan development and implementation process based on the 4MAT model.

Key words: Mathematics Education, Pedagogical Content Knowledge, 4MAT Model, Prospective Teachers, Lesson Plans

DOI: 10.29329/ijpe.2022.426.17

* This study was produced from a part of the doctoral dissertation prepared by the first author under the supervision of the second author.

1 Feyza Aliustağlou, Dr., Mathematics and Science Education, Kastamonu University, ORCID: 0000-0001-9262-5216

Correspondence: fdemirci@kastamonu.edu.tr

2 Abdulkadir Tuna, Prof. Dr., Mathematics and Science Education, Kastamonu University
INTRODUCTION

It is stated that teachers should have various competencies and these competencies are expressed as “The knowledge, skills, and attitudes that teachers should have in order to fulfill their profession efficiently and effectively” (MoNE, 2017). One of these competencies is planning the education and training process effectively (MoNE, 2017). Lesson planning refers to the technical knowledge necessary to ensure effective classroom performance (Rusznyak & Walton, 2011).

There are various issues to be considered in lesson planning. Baki and Arslan (2015) state that the activities prepared while planning a lesson should be selected according to the level and preliminary information of the students, and the order of the samples and the number of samples provided should be adjusted appropriately. In addition, an effective lesson design to be aware of the learning difficulties and misconceptions that students may have regarding the subject to be taught; it also requires taking precautions for this. From these perspectives, it can be said that lesson planning is also closely related to pedagogical content knowledge concept.

The concept of pedagogical content knowledge (PCK) contains a lot of information such as knowing what will make learning easier and harder, the concepts and prior knowledge of students about the subject, the learning difficulties of students about that subject, what kinds of mistakes they make, which misconceptions they have, and which examples or explanations should be used to eliminate these misconceptions (Shulman, 1987). Again, Ball, Thames, and Phelps (2008) state that this concept includes different skills such as sorting mathematical content, selecting examples that will take students deeper into mathematical content, and guessing what students will find interesting and motivating when choosing an example. Considering the definitions made for the concept of pedagogical content knowledge, it is seen that this concept is important for lesson planning skills.

One of the models, which is based on the constructivism approach and which can be used in lesson plan designs, is the 4MAT (4 Mode Application Techniques) model developed by Bernice McCarthy (McCarthy, 1990). The 4MAT model is an 8-step teaching cycle based on individual learning styles and brain hemispheres (McCarthy, 1990; McCarthy, 2014). The 4MAT model is a model in line with the 21st Century Learning Standards, in which students not only memorize information, but use them in real life environments and explore the creative use of learning (Shaughnessy, 2013). The teaching cycle based on the 4MAT model is presented in Figure 1.

Figure 1. 4MAT Model and Its’ Eight Steps (Morris and McCarthy, 1999)
In this model, in terms of learning styles, it is stated that students have individual preferences in the learning process, perceive and process information in their own ways, and there are four learning styles, all of which are of equal importance. It is argued that each individual will participate in the whole learning cycle and learn from each other and develop in different regions (McCarthy, Germain & Lippitt, 2002; Morris & McCarthy, 1999). In terms of brain hemispheres, the 4MAT model is a model that states that the dominance of the right and left hemispheres of the brain varies from person to person, while in some students the left hemisphere is more active, in some students the right hemisphere is more active. Teaching individuals in each of the four learning styles should be done using both the right and left hemisphere techniques of the brain. Thus, those who use the right hemisphere more actively will develop in the left hemisphere and those who use the left hemisphere more actively will develop in the right hemisphere (McCarthy, Germain & Lippitt, 2002; McCarthy, 2014; Morris & McCarthy, 1999).

The first step of the 4MAT model cycle is the step where students are provided with activities to establish a relationship between the concept to be learned and daily life. In the second step, the examples presented in the first step are analyzed. The third step is just before teaching the concepts and various activities are offered for students to visualize the concept in their minds. In the fourth step, the concepts are explained by the teacher. In the fifth step, the aim is to consolidate the learned information. Based on this, various implementations are made. In the sixth step, students expand their learning; they add to what they have learned from themselves. When the seventh step is reached, the evaluation and criticism of the practices and learned are done. In the eighth step, what has been done in the previous steps is presented and shared with the others. In this step, what is learned is integrated (McCarthy, Germain & Lippitt, 2002).

In the literature, there are many studies showing that the 4MAT model has a positive effect on the students’ academic achievement (e.g. Aktaş & Bilgin, 2015; Alanazi, 2020; Aydintan, Şahin & Uysal, 2020; İnel, 2018), the permanence of learning (e.g. Aydintan, Şahin, & Uysal, 2020; Tsai, 2004) and students’ attitudes towards the lesson (Aktaş & Bilgin, 2015; Burkum, 2010; Özgen & Alkan, 2012; Ramirez & Laurinco, 2015; Taylor, 2018). Kaewkiriya (2017) specified that teaching based on the 4MAT model facilitates effective and attractive learning. Additionally, Omar, Al-Shunnaq & Al-Omari (2018) stated that teaching based on the 4MAT model is effective on metacognitive thinking. On the other hand, In Kelley (1990)'s study, which includes teachers’ views based on the 4MAT model, a course was organized to introduce teachers to the 4MAT model, and their views on the model were taken after a while. In addition, administrators participated in this study. Teachers and administrators gave positive opinions about the 4MAT model and stated that they started using this model in their own programs. In the study of Özdoğan (2012), after three middle school mathematics teachers gave teaching based on the 4MAT model in their classes, the teachers’ opinions about the 4MAT model were taken. Teachers stated that the 4MAT model is useful in many aspects such as frequency of material use, concretizing the subject, providing permanent learning, the student’s production of information himself/herself, better understanding of the subject.

In addition, in the literature, there are studies in which tools such as concept caricatures and concept maps are used to reveal and eliminate misconceptions while preparing a lesson plan suitable for the 4MAT model (Ergin, 2011). In addition, classroom discussions, analyses, and brainstorms are conducted in teaching based on the 4MAT model, and all these processes provide an examination of student thinking (McCarthy, 1990). In addition, in the 4MAT model, the emphasis is placed on activating students in the learning process and using different strategies/methods and techniques to better understand the subject to be taught (Morris & McCarthy, 1999). Considering the role of examining student thinking and designing the teaching process in pedagogical content knowledge, the importance of using 4MAT model in researches related to pedagogical content knowledge is more clearly seen.

In the studies of Wright (2009) and Shuilleabhain (2016), the PCK development of teachers and in the study of Baki (2012), the PCK development of prospective teachers were examined within the scope of lesson study method. As the data collection tool, focus group interviews, observation
notes, lesson plans developed by teachers/prospective teachers, etc. used. In the studies of Cavin (2007), Fernández (2010), Yeşildere-İmre and Akkoç (2012), the development of prospective teachers’ pedagogical content knowledge was examined within the scope of micro-teaching/micro-teaching lesson study methods. Similarly, one of the data collection tools used in these studies is the lesson plans developed by prospective teachers. On the other hand, in the studies of Ergül (2016) and Tataroğlu Taşdan and Çelik (2017), the PCK developments of the teachers were examined within the scope of the action research, and interpretations were made based on the lesson plans developed by the teachers.

When the studies are examined, it is seen that lesson plans are used as an important data collection tool in studying the development of PCK. From this point of view, in this research, the PCK development of prospective teachers was examined within the scope of the lesson plans they developed and the trainings they did. It is thought that the experiences that prospective teachers will gain based on developing a lesson plan have an impact on their PCK. Indeed, Lim, Son and Kim (2018), in the studies where prospective teachers’ skills of developing lesson plans are examined, they stated that preparing lesson plans and teaching is the skills that are constantly developing during the professional lives of teachers. Although it is stated that the 4MAT model is a model used in lesson planning (McCarthy, 1990), there is no study in the literature that examines the PCK developments of teachers or prospective teachers based on the lesson plan development and teaching process. In this sense, the study is thought to contribute to the gap in the literature.

In this research; the concept of PCK is discussed within the scope of components: Content knowledge, knowledge of student understanding, and knowledge of instructional strategies. The aim of this study is to investigate the change of prospective mathematics teachers’ pedagogical content knowledge (PCK) on the linear equation and slope subject based on the lesson plan development and implementation process based on the 4MAT model. In line with this aim, the question of the research is, “How does the pedagogical content knowledge of prospective mathematics teachers change in the process of developing and implementing a lesson plan based on the 4MAT model? In line with this problem, answers to the following sub-problems were sought:

- How does the content knowledge of prospective mathematics teachers change in the process of developing and implementing a lesson plan based on the 4MAT model?
- How does the knowledge of student understanding of prospective mathematics teachers change in the process of developing and implementing a lesson plan based on the 4MAT model?
- How does the knowledge of instructional strategies of prospective mathematics teachers change in the process of developing and implementing a lesson plan based on the 4MAT model?

**METHOD**

**Research Model**

This research was carried out based on mixed research methods. The mixed research method focuses on collecting, analyzing and collating both quantitative and qualitative data. Its basic premise is the combined use of qualitative and quantitative data, providing a much better understanding of the research problem than any method used alone. (Creswell & Plano Clark, 2007). The quantitative part of the study consisted of the analysis of 48 lesson plans developed by 16 prospective teachers in three stages. In the analysis of the lesson plans, the lesson plan evaluation rubric developed by the researcher was used, and the qualitative data were quantified. In the qualitative part of the research, various qualitative sections from the lesson plans showing the development of prospective teachers were presented. In addition, observation notes were kept for the teachings made by prospective
teachers based on the second lesson plans. An example of the observation notes held by prospective teachers is given in Appendix 1.

**Sample**

The study group of the research consisted of 16 prospective teachers who were at the third grade level of the Elementary Mathematics Education Department. The prospective teachers who participated in the study were determined by using a random sampling method among 30 prospective teachers who are taking Special Teaching Methods-I and II courses. The random sampling method is a method in which the sample has the power to represent the universe, and the probability of sampling units to be sampled in this method is equal and independent (Büyüköztürk et al., 2014). During the separation of the prospective teachers into two groups, the prospective teachers were not told about the 4MAT model and the process.

Until prospective teachers reached third-grade level, they took mathematics-related courses such as General Mathematics, Analysis-I, Analysis-II, and education courses such as Introduction to Educational Science, Instructional Technologies and Material Design, Teaching Principles and Methods. Taking into account the ethics of the research, the real names of prospective teachers who participated in the study were not used, and prospective teachers were given codes from PT1 to PT16.

**Implementation**

The implementation process was presented in detail in Table 1.

**Table 1. Implementation Process**

<table>
<thead>
<tr>
<th>Stage</th>
<th>What is held at this stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the prospective teachers are given any information about the development of lesson plan</td>
<td>Acquisitions for linear equation and slope subjects at the 8th grade level of secondary school mathematics curriculum are “Creates and interprets the tables, graphics, and equations of real-life situations involving linear relationship” and “Explains the slope of the line with models; relates linear equations, graphics and related tables to slope”. First of all, these acquisitions were randomly divided among prospective teachers and they developed a lesson plan for these acquisitions.</td>
</tr>
<tr>
<td>Giving information about 4MAT model and PCK to prospective teachers</td>
<td>Prospective teachers were given training based on the 4MAT model. This training includes introducing the 4MAT model and presenting examples from the developed lesson plans based on the 4MAT model. Some of these lesson plans are the translation of the lesson plans on the websites <a href="http://www.aboutlearning.com">www.aboutlearning.com</a>, <a href="http://www.4mationweb.com">www.4mationweb.com</a> to Turkish, while others are lesson plans previously developed for the 4MAT model directly by the researcher. These lesson plans were examined with prospective teachers and discussions were made on the lesson plans. In addition, a presentation was made to prospective teachers about the meaning of the concept of PCK and the meaning of the PCK components’ (content knowledge, knowledge of students understanding, and knowledge of instructional strategies) The prospective teachers re-developed the lesson plans they developed after the training given the 4MAT model and the PCK components.</td>
</tr>
<tr>
<td>After the prospective teachers has been informed about 4MAT model and PCK</td>
<td>Each prospective teacher made teachings based on these lesson plans, and after these teachings, discussions were held on the teachings. In addition, observation notes were kept by the researcher and other prospective teachers during the teaching. At the end of the teaching, the prospective teachers who taught the subject were evaluated by the prospective teachers themselves, the other prospective teachers, and the researcher. In this evaluation process, self/peer/ expert evaluation forms developed by the researcher were used. These assessments addressed both the steps of the 4MAT model and the PCK components. The prospective teachers reorganized the lesson plans they prepared considering these evaluations and discussions. Thus, each prospective teacher developed a total of 3 lesson plans, while the first lesson plan not adhering to any model and the second and third lesson plans are based on the 4MAT model.</td>
</tr>
</tbody>
</table>
Data Analysis

The lesson plans developed by prospective teachers were analyzed according to the lesson plan evaluation rubric developed by the first researcher. This rubric consists of two parts. The first part is to the compliance of the lesson plans with the 4MAT model; and the second part is to examine the compatibility with PCK components. While developing items in the rubric, the steps of the 4MAT model, and the definitions for the components included in the PCK were taken into consideration.

After the rubric was developed, the opinions of three mathematics educators and one assessment and evaluation specialist were taken. In addition, the rubric has been piloted. During the pilot implementation phase, the lesson plans that the prospective teachers developed based on the 4MAT model for different acquisitions in the previous periods were analyzed through the rubric. Some changes were made in the rubric according to the experts’ opinions and pilot application results. For example, while the first version of the rubric included items between 1-5, it was decided that the evaluation would include 1-3 coding in order to make a more reliable analysis, and some items in the rubric were removed. In addition, the fact that the expected behavior was not reflected in the lesson plan was evaluated as “not observed” (0) by examining the studies in the field (Gökkurt, 2014). Some items belonging to the rubric were given in the findings section and the entire rubric was given in Appendix 2. The rubric consisted of 15 items belonging to the 4MAT model; 6 items belonging to the content knowledge component, 5 items belonging to the knowledge of student understanding component, and 9 items belonging to the knowledge of instructional strategies component.

For the reliability of the research, the analysis of 6 lesson plans which were randomly selected from the data set and consisting of 3 stages of 2 prospective teachers was made separately. While one of the analysts is the first researcher, the other is a mathematics teacher who has experience in developing a lesson plan based on the 4MAT model and is related to the master’s thesis 4MAT model. Inter-rater compliance rates were calculated using the inter-rater reliability coefficient formula, % of consensus = consensus / (consensus + divergence) (Miles & Huberman, 1994), and percentages were 0.84, 0.78, 0.80, and 0.80 for 4MAT model, content knowledge, knowledge of student understanding, and knowledge of instructional strategies, respectively. A reliability calculation above 70% is considered reliable for researches (Miles & Huberman, 1994). Based on this, it can be said that the analysis made were reliable. Regarding the non-compliance items, two evaluators came together and the reason for the difference in the evaluation was discussed. After this stage, the researcher continued the lesson plan analysis individually according to the rubric she developed.

An example based on the evaluation of the lesson plans of PT1 (prospective teacher-1) regarding the item 7 of the instructional strategies knowledge components, “Being able to use different teaching strategies/methods and techniques suitable for the teaching of the subject” was presented in Table 2.

<table>
<thead>
<tr>
<th>Lesson plan</th>
<th>Scoring</th>
<th>Description for scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First lesson plan</td>
<td>1 (insufficient)</td>
<td>A completely teacher-centered education was carried out.</td>
</tr>
<tr>
<td>Second lesson plan</td>
<td>2 (partly sufficient)</td>
<td>The teacher is in the center, but sometimes teaching techniques such as question-answer, discussion, and analogy were used.</td>
</tr>
<tr>
<td>Third lesson plan</td>
<td>3 (sufficient)</td>
<td>Teaching techniques such as question-answer, discussion, and analogy were used as in the second lesson plan. In addition, the student was able to access the information himself/herself in many parts of the lesson plan.</td>
</tr>
</tbody>
</table>

Whether there is a statistically significant difference in PCK components in the lesson plans developed by prospective teachers was analyzed by using appropriate tests (Friedman test, Wilcoxon test, one-way ANOVA for repeated measurements test). One-way ANOVA for repeated measurements test is used to test whether there is a statistically significant difference between the mean of the data
obtained as a result of successive measurements from the same data source. The non-parametric form of the one-way Anova for repeated measurements test is the Friedman test (Can, 2017). The Friedman test gives whether there is a significant difference between the measurements, but does not give between which measurements this difference is. It is recommended to use the Wilcoxon test (non-parametric test in which two measurement results are compared for related measurements) to reveal between which measurements there are significant differences (Can, 2017). The tests used and why these tests are used were explained in Table 3.

Table 3. The tests used to examine the changes in the pedagogical content knowledge in the lesson plans of prospective teachers

<table>
<thead>
<tr>
<th>Component</th>
<th>The tests used</th>
<th>Why this test was used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content knowledge</td>
<td>Friedman Test and then Wilcoxon test</td>
<td>According to the normality results obtained by making different examinations, it was concluded that the first lesson plan content knowledge scores did not show normal distribution, while the second and third lesson plan content knowledge scores showed normal distribution. Since two of the measurements showed a normal distribution and one did not, whether there was a statistically significant difference between the three measurements was analyzed using the Friedman Test. And then, Wilcoxon test was used to reveal between which measurements were significant differences.</td>
</tr>
<tr>
<td>Knowledge of student understanding</td>
<td>One-way ANOVA for repeated measurements test</td>
<td>According to the normality results obtained by making different examinations, it was concluded that the comprehension knowledge scores of all three lesson plan students showed a normal distribution. Since all three of the measurements showed normal distribution, whether there was a statistically significant difference between the three measurements was analyzed using the one-way Anova test for repeated measurements.</td>
</tr>
<tr>
<td>Knowledge of instructional strategies</td>
<td>Friedman Test and then Wilcoxon test</td>
<td>According to the normality results obtained by different examinations, it was concluded that the first and third lesson plan knowledge of instructional strategies scores were normally distributed, but the second lesson plan instructional strategies knowledge scores did not show normal distribution. Since two of the measurements showed a normal distribution and one did not, whether there was a statistically significant difference between the three measurements was analyzed using the Friedman Test. And then, Wilcoxon test was used to reveal between which measurements were significant differences.</td>
</tr>
</tbody>
</table>

After analyzing quantitatively whether the prospective teacher showed a statistically significant improvement in the PCK components, various qualitative sections from the lesson plans showing the development of the prospective teachers were presented. These sections were presented within the framework of the items in the lesson plan evaluation rubric for each pedagogical content knowledge component. Thus, quantitative results were supported by qualitative sections.

RESULTS

Findings for the First Sub-problem

The first sub-problem of the research was consisted of “How does the content knowledge of prospective mathematic teachers change in the process of developing and implementing a lesson plan based on the 4MAT model?”. First of all, quantitative analyzes were presented to seek an answer to this sub-problem. The mean scores of prospective teachers in the content knowledge component were given in Figure 2.
Figure 2. The Mean Scores of Content Knowledge Obtained From the Lesson Plans

The Friedman test results were presented in Table 4.

Table 4. "Friedman Test" Results Regarding the Lesson Plans-Content Knowledge Mean Scores

<table>
<thead>
<tr>
<th>Lesson plans</th>
<th>N</th>
<th>Mean</th>
<th>Sd</th>
<th>Mean rank</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First lesson plan</td>
<td>16</td>
<td>22.92</td>
<td>9.70</td>
<td>1.00</td>
<td>31.524</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Second lesson plan</td>
<td>16</td>
<td>53.12</td>
<td>9.73</td>
<td>2.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third lesson plan</td>
<td>16</td>
<td>81.25</td>
<td>10.90</td>
<td>2.97</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 4 was examined according to the results of the Friedman test, it was seen that the prospective teachers’ content knowledge differed significantly ($\chi^2(2, N=16) = 31.524, p < 0.05$). The Wilcoxon test results were presented in Table 5.

Table 5. "Wilcoxon Test" Results Regarding the Lesson Plans-Content Knowledge Mean Scores

<table>
<thead>
<tr>
<th>Lesson plans</th>
<th>Ranks</th>
<th>N</th>
<th>Mean rank</th>
<th>Sum of ranks</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First l.p.-Second l.p.</td>
<td>Negative rank</td>
<td>0</td>
<td>.00</td>
<td>.00</td>
<td>-3.523</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Positive rank</td>
<td>16</td>
<td>8.50</td>
<td>136.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second l.p.-Third l.p.</td>
<td>Negative rank</td>
<td>0</td>
<td>.00</td>
<td>.00</td>
<td>-3.418</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Positive rank</td>
<td>15</td>
<td>8.00</td>
<td>120.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First l.p.-Third l.p.</td>
<td>Negative rank</td>
<td>0</td>
<td>0.00</td>
<td>.00</td>
<td>-3.529</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Positive rank</td>
<td>16</td>
<td>8.50</td>
<td>136.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As seen in Table 5, a statistically significant difference was observed between the content knowledge scores obtained from all lesson plans. As a result, it can be said that the implementation process based on the 4MAT model contributed to the development of the content knowledge of the prospective teachers at each stage of the lesson plan development. In order to better see the progress of prospective teachers in the content knowledge component, various examples from the content knowledge developments in the lesson plans were presented.

The presented example is based on the examination of PT5’s lesson plans in terms of “Giving sufficient and appropriate examples to create mathematical content”. The examples that PT5 included in the lesson plans respectively were shown in Table 6.
Table 6. Examples of PT5 in the Lesson Plans

<table>
<thead>
<tr>
<th>Lesson plan</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>First lesson plan</td>
<td>( y = 2x )</td>
</tr>
<tr>
<td></td>
<td>( y = -x + 2, \ y = 2x - 1, \ y = 4x - 16, \ y = 3x, \ y = 2x + 4 )</td>
</tr>
<tr>
<td>Second lesson plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Third lesson plan</td>
<td>( y = x ), ( y = -x ), ( \frac{x}{2} ), ( y = x + 2 ), ( y = -2x - 6 ), ( \frac{3}{2}x + 1 )</td>
</tr>
<tr>
<td></td>
<td>( 3x - 2y + 2 = 0 )</td>
</tr>
</tbody>
</table>

When examining the given examples, it was seen that the first lesson plan of PT5 included only one example that will represent \( y = 2x \) equation. The expression in the lesson plan for this example is as in Figure 3.

If we write an example on the blackboard:

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

According to the data in the table:

- Fill in the sections “?”
- Create an equation using x and y.
- Draw the graph of the equation in the coordinate system.

**Figure 3. A Section from the First Lesson Plan of PT5**

In the second lesson plan, it can be said that although there were different examples about the lines passing through and not passing through the origin, PT5 did not give any examples for the lines in type \( ax + by + c = 0 \). In addition, it was seen that PT5 did not include negative slope line graphs passing through the origin, and examples of lines that do not pass through the origin were given before then the lines passing through the origin. In the third lesson plan, PT5 first included the line graphs passing through the origin and then the line graphs that did not pass through the origin. In addition, PT5 gave appropriate examples of different line equations with positive/negative slope, passing/not passing through the origin and which can be expressed in different ways. From this point of view, it was concluded that the examples included in the third lesson plan of PT5 were sufficient and appropriate. A section from the third lesson plan was presented in Figure 4.

Let’s plot the line indicated by the equation \( y = x + 2 \).

<table>
<thead>
<tr>
<th>x</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Ordered pair</td>
<td>(-2,0)</td>
<td>(-1,1)</td>
<td>(0,2)</td>
<td>(1,3)</td>
</tr>
</tbody>
</table>

Let’s mark the points we have determined in the coordinate system and draw the graph.

Let’s draw our graph in a different way. Let’s find the points where the line crosses the x and y axes.

For \( x = 0, y = 0 + 2, y = 2 \). Point \((0,2)\) is the point where the graph crosses the y-axis.

For \( y = 0, 0 = x + 2, x = -2 \). Point \((-2,0)\) is the point where the graph crosses the x-axis.

Let’s mark these points in the coordinate system. Let’s draw a graph of the line passing through these points.
From the point of view of the content knowledge component, in the process of using the 4MAT model, prospective teachers noticed the mistakes and deficiencies in the content knowledge while organizing the content information in the fourth step. It was observed that they overcame these shortcomings during the next lesson plan development phase. This situation led to an improvement in the items related to the content knowledge in the lesson plan evaluations. For example, when it was evaluated in terms of “Making the necessary mathematical explanations appropriately” and “Giving the logical grounds underlying the concepts”, it was concluded that the prospective teachers had deficiencies in the first lesson plans. In the last lesson plans, the prospective teachers showed an improvement, for example, they explained the situations where the slope was zero and undefined in detail by using the change rate meaning of the slope.

**Findings for the Second Sub-problem**

The second sub-problem of the research was consisted of “How does the knowledge of student understanding of prospective mathematics teachers change in the process of developing and implementing a lesson plan based on the 4MAT model?” The mean scores of prospective teachers in the knowledge of student understanding component were given in Figure 5.

As seen in Table 7, a statistically significant difference was found between the knowledge of student understanding mean scores obtained from all lesson plans $[F_{(2,30)} = 168,601, p < .05]$. The results

![Figure 4. A Section from the Third Lesson Plan of PT5](image)

![Figure 5. The Mean Scores of Knowledge of Student Understanding Obtained From the Lesson Plans](image)
of the analysis based on determining which measurements differ significantly were presented in Table 8.

**Table 7. Comparison of the Differences in the Lesson Plans**

<table>
<thead>
<tr>
<th>Compared lesson plans</th>
<th>Average difference</th>
<th>Standart error</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First l.p.-Second l.p.</td>
<td>-34.166</td>
<td>3.985</td>
<td>.000</td>
</tr>
<tr>
<td>Second l.p.-Third l.p.</td>
<td>-29.584</td>
<td>2.787</td>
<td>.000</td>
</tr>
<tr>
<td>First l.p.-Second l.p.</td>
<td>-63.751</td>
<td>3.546</td>
<td>.000</td>
</tr>
</tbody>
</table>

When Table 8 was examined, it was seen that there is a statistically significant difference between the averages of all measurements ($p < 0.05$). Based on these results, it can be said that the application process based on the 4MAT model contributed to the development of knowledge of student understanding of the prospective teachers in each lesson plan development stage.

In order to better see the progress of the prospective teachers in the knowledge of student understanding component, various examples from the knowledge of student understanding developments in the lesson plans were presented. The first example presented is for examining the lesson plans of PT13 based on the criteria of “**Selecting examples that students will find interesting and motivating**”. When the lesson plans of PT13 were examined, it was seen that the first lesson plan included slope calculation only through the algebraic and graphic representation of the equations, and did not include any examples that could attract the students’ interest. A section from the first lesson plan of PT13 was presented in Figure 6.

**Lines with a slope of 0:**

The slope of the lines parallel to the x axis is 0.

![Figure 6. A Section from the First Lesson Plan of PT13](image)

Let’s assume that the line is the line $y = 3$.

Since $y = 3\div 0 \cdot x$, the slope is 0.

Looking at the graph, there is no change in y values. So I teach that the slope of these lines is 0.

**Lines with slope not calculated (without slope):**

The slope of the lines parallel to the y axis cannot be calculated, so there is no slope.

Looking at the graph, it is seen that y values change but x values do not. So I teach that the slope of these lines cannot be calculated.

**Figure 6. A Section from the First Lesson Plan of PT13**

Various sections from the examples that PT13 includes in the second and third lesson plans were presented in Figure 7.
When examining these lesson plans, it was concluded that the examples given by PT13 included daily life situations and are more suitable for attracting students' attention.

Another item that is addressed in the knowledge of student understanding component is “Being aware of students' mistakes and misconceptions about the mathematical content taught and including it in the lesson plans”. An example based on the development of prospective teachers in this item was given from the lesson plans of PT14. When the first lesson plan of PT14 was examined, no statement was found to show that PT14 was aware of students' mistakes and misconceptions. In the second lesson plan, PT14 included the activity in Figure 8.
When the second lesson plan of PT14 was analyzed, it was concluded that PT14 had an idea partially about the students' mistakes/misconceptions and tried to design an activity based on this. However, PT14 also had learning deficiencies such as "Expressing the undefined state of the slope as being infinite". In the third lesson plan, PT14 included concept caricatures on the subject. One of the concept caricatures was presented in Figure 9.

**Figure 8. A Section from the Second Lesson Plan of PT14**

When examining the concept caricature included in the third lesson plan of PT14, it was seen that PT14 mentioned the mistakes that the students actually made. These are mistakes such as students thinking of the slope as the coefficient of $x$ in any case without going to edit the given equation, and mixing the situations where the slope is undefined and 0. In addition, while PT14 expressed the undefined state of the slope as infinity in the second lesson plan, she corrected her own wrong learning about the subject in the third lesson plan. When the lesson plans were analyzed as a whole, it was
concluded that PT14 showed improvement regarding the awareness of the mistakes/misconceptions in the students.

In terms of the knowledge of student understanding component, it was seen that the prospective teachers did not mention student mistakes in their first lesson plans. Considering the second and third lesson plans, it was concluded that the concept caricatures, crossword activities, and discussion environments based on these activities contributed to addressing students’ different thoughts and interpreting students’ thoughts.

**Findings for the Third Sub-problem**

The third sub-problem of the research was consisted of “How does the knowledge of instructional strategies of prospective mathematis teachers change in the process of developing and implementing a lesson plan based on the 4MAT model?” The mean scores of prospective teachers in the knowledge of instructional strategies component were given in Figure 10.

![Figure 10. The Mean Scores of Knowledge of Instructional Strategies Obtained From the Lesson Plans](image)

The Friedman test results were presented in Table 9.

<table>
<thead>
<tr>
<th>Lesson plans</th>
<th>N</th>
<th>Mean</th>
<th>Sd</th>
<th>Mean Rank</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First lesson plan</td>
<td>16</td>
<td>14.81</td>
<td>5.89</td>
<td>1.00</td>
<td>32.00</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Second lesson plan</td>
<td>16</td>
<td>48.38</td>
<td>11.75</td>
<td>2.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third lesson plan</td>
<td>16</td>
<td>73.84</td>
<td>14.09</td>
<td>3.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 9 was examined according to the results of Friedman test, it was seen that the prospective teachers’ knowledge of instructional strategies differed significantly $[\chi^2_{(2,N=16)} = 32.00, p < 0.05]$. The Wilcoxon test results were presented in Table 10.
As seen in Table 10, a statistically significant difference was observed between the knowledge of instructional strategies mean scores obtained from all lesson plans \((p < 0.05)\). As a result, it can be said that the application process based on the 4MAT model contributed to the development of the knowledge of instructional strategies of the prospective teachers at each stage of the lesson plan development.

In order to better see the progress of prospective teachers in the knowledge of instructional strategies component, various examples from the instructional strategies developments in the lesson plans were presented. The presented example is based on the examination of PT9’s lesson plans in terms of “Using different teaching methods and techniques appropriate for the teaching of the subject”, “Engaging actively students in the lesson” and “Designing learning environments for the students to solve learning difficulties, mistakes, and misconceptions and to teach concepts effectively”. In Figure 11, a section from the first lesson plan of PT9 was given.

![Figure 11. A Section from the First Lesson Plan of PT9](image-url)

When examining the first lesson plan of PT9, it was seen that a lesson in which the teacher was more active than the students was planned and the information was generally presented by the teacher. From time to time, students were tried to access some information themselves (Like the expression “Here the student is provided to show that the change in the coefficient of \(x\) is the slope”). In addition, different teaching methods/techniques were not included in the first lesson plan too much. In the second lesson plan, class discussions and group studies were conducted based on the 4MAT model, and students were asked to question the slope concept through the activity presented in Figure 12 before informing by the prospective teacher about the slope concept.
Imagine you have a piggy bank. There is no money in your piggy bank.

1 a. You throw 1 TL into the piggy bank every day.
1 b. You throw 2 TL into the piggy bank every day.

According to these cases, fill in the table containing the relationship between the number of days (x) and the amount of money in the piggy bank (y). How does y values change as x values increase? Consider what the increase or decrease in y values depend on.

**For the 1a:**

<table>
<thead>
<tr>
<th>Days past (x)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The amount of money in the piggy bank (y)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**For the 1b:**

<table>
<thead>
<tr>
<th>Days past (x)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The amount of money in the piggy bank (y)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

They are asked to show the values in the table on the graph and combine the dots to create lines and write the equations of these lines. Then they are asked to examine the lines. They are expected to make an inference.

- What are the differences in the graphics of the lines? What would be the reason?
- What can be said about the steepness of the graphics?
- How do the values of x and y variables change in lines? Then consider the relationship between the two (x, y) ordered pairs you choose. Try to relate it to the differences in the graphics.

**Figure 12. A Section of the Second Lesson Plan of PT9**

As seen from the activity, in the second lesson plan, PT9 designed a teaching process to make students think about the concept of slope. She did not give the definition of the slope directly and provided the students to reach the results themselves. From this point of view, it can be said that a better teaching process was designed to teach concepts effectively. However, at this stage, there were also cases where PT9 presented the information directly in some cases. The statement given reflects this situation: “*For example y = x, y = 2x. They were always leaning to the right. But in y = −3x−5, the situation is different. We see that the x values increase while the y values decrease. Then we can say that if we are generalizing, the slope in such lines is equal to the coefficient of x. At the same time, we can say that the slope of the lines leaning to the left will be negative*.” When examining this expression, it was seen that a generalization was made by PT9 as "*The slope of the lines leaning to the left is negative*." A section from the third lesson plan of PT9 was presented in Figure 13.
When the activity in Figure 13 was analyzed, it was seen that PT9 wanted students to question the slopes of all lines that pass/do not pass through the origin and have a negative/positive slope. With this activity, it was aimed that the students see that the slope is constant even if different points are taken on the line and in which cases the slope of the line is negative. When the lesson plan was analyzed as a whole, it was concluded that PT9 developed in terms of active participation of the students in the lesson, providing the student to reach the information herself/himself, and designing a more effective process for teaching the concepts.

In terms of the knowledge of instructional strategies component, in the first lesson plans, it was seen that prospective teachers generally designed the lesson as teacher-centered, used different teaching strategies/methods/techniques very little or not at all, and did not consider the student's active participation in the lesson. In the second lesson plans, based on the 4MAT model, question-answer, discussion, etc. methods were used. Based on the discussions they have made over the concept caricatures they have prepared, they have tried to design teaching aimed at eliminating students’ mistakes/misconceptions. In the third lesson plans, generally, a transition was made from the teacher-centered teaching process to the student-centered teaching process. Emphasis was placed on the active participation of students in the lesson, and students were provided with access to information through various questions, activities, and directions. In this development, it is considered that the process of developing a lesson plan based on the 4MAT model, conducting, and evaluating these trainings with self/peer and expert evaluations is effective.

CONCLUSION AND DISCUSSION

As a result of the research, it was seen that the prospective teachers' content knowledge showed improvement during the lesson plan development and implementation process based on the 4MAT model. This result is similar to some studies in the literature. As a result of lesson study applications in Wright (2009)’s work and as a result of professional training given in the studies of Nielsen (2009) and Naseer (2016); it was concluded that the content knowledge of the teachers improved. After the training given in the study of Nielsen (2009), it was stated that the lecture processes of the teachers were recorded by video and that the content knowledge improved as a result of the feedback given in this process. In the study of Naseer (2016), it was stated that teachers' content knowledge was improved in terms of making algebraic explanations, solving problems, noticing
wrong expressions in textbooks. In this study, similar to the studies mentioned, it was concluded that prospective teachers’ content knowledge improved as a result of the teachings and discussions on these teachings. Another result related to the content knowledge component is the development of the prospective teachers’ definition skills. This result is similar to the findings of Seviş (2008). Similarly, in this research, it has been concluded that prospective teachers’ ability to make definitions improved after the implementations made within the scope of the mathematics teaching methods course.

In the process of developing and implementing a lesson plan based on the 4MAT model, prospective teachers also improved in the knowledge of student understanding component. Based on professional training provided in the study of Naseer (2016), lesson study practices in the study of Baki (2012), and action research in the studies of Eroğlu (2016) and Tataroğlu Taşdan and Çelik (2017); it was concluded that teachers and prospective teachers improved in terms of determining in which points students may have learning difficulties and misconceptions. On the other hand, Yeşildere İmre and Akkoç (2012) stated that, as a result of micro-teaching practices, prospective teachers improved in terms of considering students’ understandings and difficulties about patterns. Although the methods used are different, the results obtained from this research are similar to the results obtained from the mentioned studies. Similarly, in these studies, it was concluded that prospective teachers showed improvement in the knowledge of student understanding component. It is thought that the teachings and discussions on these teachings were effective in the development of the prospective teachers’ knowledge of student understanding component. Another result obtained in terms of knowledge of student understanding component is the development of prospective teachers’ giving examples that will appeal to students. It can be said that this development is compatible with the study of Shuilleabhain (2016), which shows that prospective teachers’ interesting examples giving skills have improved based on the use of the lesson study model.

In the process of developing and implementing a lesson plan based on the 4MAT model, prospective teachers showed improvement in many aspects of the knowledge of instructional strategies component. When the lesson plans were analyzed, it was seen that prospective teachers switched from teacher-centered to student-centered teaching approach and gained the ability to keep the student active during the lesson. Similarly, Tataroğlu Taşdan and Çelik (2017) stated as a result of the action research, Baki (2012) and Shuilleabhain (2016) stated as a result of the lesson study practices that teachers/prospective teachers showed improvement in the specified directions. Another result is that prospective teachers showed improvement in the use of multiple representations. Similarly, based on the action research conducted by Eroğlu (2016) and Tataroğlu Taşdan and Çelik (2017); and as a result of the practices carried out based on the lesson study model in Shuilleabhain (2016)’s study, it was reached the conclusion that teachers developed in terms of using different forms of representations.

On the other hand, prospective teachers’ development in terms of the transition from rule-based and memorized explanations to conceptual explanations is similar to the findings of Bütün (2012), and the development in terms of instructional explanation qualities is similar to Baki (2012). Besides, the development of prospective teachers’ skills to include class discussions is similar to the findings of Eroğlu (2016) and Shuilleabhain (2016). In addition, prospective teachers also improved in terms of using different teaching strategies. Similarly, Naseer (2016), as a result of professional training and Yeşildere İmre and Akkoç (2012), as a result of micro-teaching practices, reached the conclusion that prospective teachers showed improvement in terms of suggesting teaching strategies aimed at eliminating students’ mistakes and using subject-specific strategies.

In the research of Fernández (2010), which uses lesson plans as a data collection tool, the micro-teaching lesson study model was used. Similar to the results of this research, when the lesson plans developed by prospective teachers at the first and last stages were examined, it was concluded that the knowledge of teaching mathematics has improved. When the mentioned studies are examined, although the methods used in the process are different methods such as action research, lesson study, micro-teaching, the findings are similar to the findings obtained from the research in terms of improving the PCK of prospective teachers. In this research, prospective teachers developed lesson
plans; as a result of the teachings and discussions based on the lesson plans, it was concluded that the prospective teachers’ PCK improved.

When the literature was examined it was observed that the opinions of both the students and the teachers who used this model in their lessons based on the 4MAT model were positive and these results can also be associated with the pedagogical content knowledge. For instance, in the study of Özgen and Alkan (2012), the derivative subject was taught based on the 4MAT model, and the students stated that this way of learning is beneficial in terms of teaching the subject in a student-oriented lesson, working with groups, practicing, associating, etc. Similarly, Özdoğan (2012) stated that the 4MAT model is useful in many aspects such as frequency of material use, the student's production of information himself/herself. In addition, Kaewkiriya (2017) specified that teaching based on the 4MAT model facilitates effective and attractive learning. On the other hand, Ramirez and Laurinco (2015) stated that while maintaining the learning style of each student in their learning process according to the 4MAT model, teachers should systematically expose all students to multiple learning techniques. When the mentioned research results are examined, it is seen that the positive effects of the 4MAT model are also related to the pedagogical content knowledge components. In the light of these results and based on the positive results obtained from the study, it is recommended to use the 4MAT model in lesson plan designs and studies to be conducted for the development of prospective teachers’ PCK.

REFERENCES


Appendix 1. Example of Observation Notes Held by Prospective Teachers

Appendix 1. Example of Observation Notes Held by Prospective Teachers

Appendix 1. Example of Observation Notes Held by Prospective Teachers

Appendix 1. Example of Observation Notes Held by Prospective Teachers
### Appendix 2. Lesson Plan Evaluation Rubric

<table>
<thead>
<tr>
<th>Compliance with the 4MAT Model</th>
<th>Not observed (0)</th>
<th>Insufficient (1)</th>
<th>Partially Sufficient (2)</th>
<th>Sufficient (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Starting the lesson appropriately based on what the students knew before</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Making the students feel why they should learn the subject</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Presenting a suitable experience that will enable students to establish a relationship between the subject and daily life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Enabling students to analyze/discuss the experience presented</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Presenting visuals that will enable students to visualize the subject in their minds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Using techniques such as brainstorming and analogy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Presenting mathematical content appropriately to the students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. While presenting the content, made use of visual or audio tools such as web resources, CDs, and movies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Enabling students to acquire the necessary skills by using worksheets and exercise books</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Enabling students to make applications other than worksheets related to the defined concepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Enabling students to make innovations / inventions / projects by making additions on the applications made</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Enabling students to improve their knowledge by using worksheets that require high-level thinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Enabling students to analyze their own work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Enabling students to analyze the work of their friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Giving an opportunity to students to present/exhibit what they did</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Compliance with the Pedagogical Content Knowledge Components

**Content Knowledge**

1. Knowing the basic definitions of the subject and reflecting them on the lesson plan
2. Giving the logical grounds underlying the concepts
3. Giving sufficient and appropriate examples to create mathematical content
4. Using terms and notations correctly
5. Making the necessary mathematical explanations appropriately
6. Asking productive mathematical questions

**Knowledge of Student Understanding**

1. Being aware of students' mistakes and misconceptions about the mathematical content taught and including it in the lesson plans
2. Predicting what students will find easy and difficult and to act in accordance with this order in the lesson plan
3. Selecting examples that students will find interesting and motivating
4. Being aware of the underlying causes of mistakes and misconceptions
5. Acting in accordance with the level of students

**Knowledge of Instructional Strategies**

1. Reminding students' prior knowledge
2. Talking about the importance and justification of the subject to be told
3. Relating the subject to daily life
4. Engaging actively students in the lesson
5. Including different representations of concepts
6. Designing learning environments for the students to solve learning difficulties, mistakes, and misconceptions and to teach concepts effectively
7. Using different teaching methods and techniques appropriate for the teaching of the subject
8. Benefiting from various course tools/equipment while explaining the subject
9. Utilizing technology where necessary
A Study on the Impact of Readability on Comprehensibility*

Halil İbrahim Öksüz
Gazi University

Hasan Kağan Keskin
Duzce University

Abstract

The aim of the study is to examine the effect of readability on comprehensibility. The study is quasi-experimental as it was not possible to assign groups randomly and the groups were partially controllable. Therefore, the "pretest-posttest unequaled control group quasi-experimental design" was used in the study. The study group consists of 121 fourth grade students divided into two experimental and two control groups. The texts taken from the Turkish textbook approved by the Education Board were used to collect the data of the research. In order to measure the comprehensibility of the texts, the comprehension scale of the Mistake Analysis Inventory was used. The analysis of the data of the study was carried out using the SPSS 24 package. In order to ensure reliability in the study, some of the comprehensibility data were scored by two raters. To do so, comprehension data from 50 randomly selected participants were used. As the comprehension data of 50 participants did not show normal distribution, the Spearman Brown Rank Differences Correlation Test was conducted in order to reveal the relationship between the two raters. According to the test results, a strong and positive significant relationship was found between the two raters ($r (48) = .88$, $p = .00$, $p < .05$). The findings showed that the original (more difficult) versions of the texts were more comprehensible than the versions simplified by the researcher. In other words, long sentences are more comprehensible than short sentences. In this direction, the present study revealed that the readable text may not always be comprehensible.

Keywords: Readability, Readability Formulas, Comprehensibility

DOI: 10.29329/ijpe.2022.426.18
INTRODUCTION

Why do people prefer reading materials that are below their level? According to Hochhouser (1997), the vast majority of people tend to read written materials that are several levels below their education level (as cited in Burke & Greenberg, 2010). This tendency that people display is an indicator that a problem exists. It stems from two sources. The first is people who choose books below their level while the second is the estimation tools that determine the level of written materials. These tools are the five-finger technique, leveled books, rubrics, checklists, and readability formulas (Ateş, Çetinkaya, & Yıldırım, 2012). Among these, readability formulas may be said to be the most frequently used. Indeed, 3,166 studies were displayed as a result of searching the concept of “readability” in the ERIC database on 16 October 2018 (ERIC, 2018). 21.57% of the existing studies have been done in the last 20 years.

Readability is discovering what is easy and difficult to make the language more comprehensible (Bormuth, 1967). Ateşman (1997) defines it as a text being labelled as easy or difficult to understand by readers. On the other hand, readability formulas are tools for mathematically calculating the difficulty of reading materials (Clarck, 1981; McLaughlin, 1969; Ülper, 2010; Walpole & McKenna, 2007). Used for the first time in institutional communication, readability is a concept frequently used in our day by educators and linguists (Ateşal, 2013).

There is much criticism in the literature for of the frequently used readability concept and readability formulas. These criticisms may be grouped under three headings. The first one is that readability formulas produce different results (Asem, 2012; Ateşman, 1997; Bargate, 2012; Chall, 1988; Çepni, Gökdere, & Kıcük, 2002; Gallagher, Fazio, & Gunning, 2012; Geçit, 2010; Köse, 2009; Okur, Arı, Ersoyal, & Okur, 2013; Stokes, 1978; Tekbıyık, 2006; Topkaya, Kalın, & Yılar, 2015; Turan & Geçit, 2010; Ulusoy, 2006). Indeed, Chall (1988) and Gallagher et al. (2012) state that even the same text measured by two independent scorers using the same formula may yield different results.

The second criticism is that authors and publishers shorten the words and sentences in reading materials so as to achieve lower readability scores (Armbruster, Osborn, & Davison, 1985; Bruce, Rubin, & Starr, 1981; Chall, 1988; Marshall, 1979). This results in low quality texts (Chall, 1988).

The final criticism in the literature is that the definitions of readability and the variables used in the formulas do not overlap. The readability definitions of many researchers who have a readability formula (Ateşman, 1997; Bormuth, 1967; Chall, 1988; Dreyer, 1984; Göğüş, 1978; McLaughlin, 1969; Tekbıyık, 2006) imply that texts need to be readable to be comprehensible. However, readability formulas, which seem to have a big influence on comprehensibility, generally use variables that depend on the syntactic structure of a given text such as average word and sentence length (Asem, 2012; Ateşman, 1997; Bezirci & Yılmaz, 2010; Davison, 1988; Fry, 2002; Gallagher et al., 2012; Kong, 2009; Okur & Arı, 2013; Tekbıyık, 2006; Zorbaz, 2007). On the other hand, readability formulas do not consider variables other than syntactic ones, which may actually affect comprehensibility greatly, such as text structure, length, logical pattern and pictures, (Fry, 2002) the reader’s interests, motivations and language skills, (Ateşal, 2013; Couris, 1987; Oakland & Lane, 2004; Stevens, Stevens, & Stevens, 1992; Wissing, Blignaut, & Van den Berg, 2016; Yazıcı & Yeşilbursa, 2007) body of vocabulary, (Yazıcı & Yeşilbursa, 2007) existing information (Marshall, 1979; Oakland & Lane, 2004; Özdemir, 2016; Pishghadam & Abbasnejad, 2016; Stevens et al., 1992; Zakuluk & Samuels, 1996) and context (Armbruster et al., 1985; Harrison & Bakker, 1998; Marshall, 1979). Akyol (2006) states that the text cannot express itself and that it is in constant interaction with the prior knowledge of the reader. Based on Akyol’s (2006b) view, it may be stated that the reader should be involved in the level identification process (Keskin & Akıl, 2013); however, readability formulas do not do this and are criticized for it (Compton, Appleton, & Hosp, 2004; Pishghadam & Abbasnejad, 2016; Stevens et al., 1992; Temur, 2003; Wissing et al., 2016).

There are many studies in the literature that find readability formulas insufficient and inconsistent in measuring the comprehensibility of reading materials (Asem, 2012; Ateşman, 1997;
Bargate, 2012; Chall, 1988; Çepni et al., 2002; Gallagher et al., 2012; Geçit, 2010; Köse, 2009; Okur & Ari, 2013; Okur et al., 2013; Stokes, 1978; Tekbıyık, 2006; Topkaya et al., 2015; Turan & Geçit, 2010; Ulusoy, 2009). In addition, there are a number of studies indicating that reading materials with high readability scores will also have high comprehensibility and that a positive relationship therefore exists between these two concepts (Ateşman, 1997; Bezirci & Yılmaz, 2010; Bormuth, 1967; Chall, 1988; Dreyer, 1984; Fry, 2002; Göğüş, 1978; Güyer, Temur, & Solmaz, 2009; Kalın & Aydemir, 2017; Köse, 2009; McLaughlin, 1969; Mert, 2018; Mirzaoğlu & Akin, 2015; Özbek & Ergül, 2018; Richards, Platt, & Platt, 1992; Tekbıyık, 2006; Yalın, 1996; Zamanian & Heydari, 2012). This difference of opinion in the literature has paved the way for this study. On the other hand, readability definitions (Ateşman, 1997; Bormuth, 1967; Chall, 1988; Dreyer, 1984; Göğüş, 1978; McLaughlin, 1969; Tekbıyık, 2006) imply that high readability is required in order for texts to be understood. However, researcher such as (Geçit, 2010; Köse, 2009; Topkaya et al., 2015; Turan & Geçit, 2010) have calculated the readability of textbook passages via different formulas and revealed that they were appropriate for the target level. When they subsequently applied the same text to the target grade level using the Cloze Test method, they concluded that the texts were comprehensible with the support of the teacher. It can therefore be claimed that there is a discrepancy between the results of the studies in the literature and the definitions of readability. The method used to measure comprehensibility in these studies was the Cloze Test method. The present study, however, attempted to measure the effect of readability on comprehensibility by using the comprehension scale of the Mistake Analysis Inventory adapted to Turkish by (Akyol, 2006). Another unique feature of the study is that it collects its data by using the original text alongside a simplified version with shorter sentences developed by the researcher. The aim of the study is to examine the effect of readability on comprehensibility. For this purpose, answers to the following questions were sought:

1. Is there a significant difference in comprehensibility scores between the original version of the first informative text and the second one simplified by the researcher?

2. Is there a significant difference in comprehensibility scores between the original version of the second informative text and the first one simplified by the researcher?

3. Is there a significant difference in comprehensibility scores between the first and second informative texts simplified by the researcher?

4. Is there a significant difference in comprehensibility scores between the original versions of the first and second informative texts?

**METHOD**

**Research Model**

This is an experimental study which aims to examine the effect of readability on comprehensibility. Experimental studies aim to see how systematic changes in the independent variable affect the dependent variable (Karasar, 2012). In addition, Büyüköztürk (2007) states that the researcher must manipulate the independent variable in order to conduct an experimental study. The manipulated variable whose effect is investigated in this study is readability, and the affected variable is comprehensibility.

The study is quasi-experimental as it was not possible to assign groups randomly (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2017) and the groups were partially controllable (Singh, 2007, p. 67). Therefore, the "pretest-posttest unequaled control group quasi-experimental design" (Karasar, 2012) was used in the study.
Study Group

The study group consists of 121 fourth grade students divided into two experimental and two control groups. Two experimental and two control sections were created in order to see whether the texts selected for the study were equivalent to each other and to avoid the "same text effect". Two sampling methods were used when determining the study group. The first was convenience sampling when determining the primary school where the study would be conducted. The second method was purposeful sampling used in order to select the 4 sections that did not differ significantly in terms of their comprehension scores by applying a pre-test in the primary school.

Data Collection Tool

The pre-test used "Winter Preparations" text taken from the Turkish textbook approved by the Education Board in the 2013-2014 academic year. The readability scores and levels of the texts used in the study are given in Table 1.

Table 1: Readability Scores and Levels of the Texts Used in the Study

<table>
<thead>
<tr>
<th>Title of Text</th>
<th>Readability Score</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycles (Original)</td>
<td>42.27</td>
<td>Difficult</td>
</tr>
<tr>
<td>Bicycles (Simplified)</td>
<td>61.02</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Mysterious Organisms (Original)</td>
<td>48.72</td>
<td>Difficult</td>
</tr>
<tr>
<td>Mysterious Organisms (Simplified)</td>
<td>61.20</td>
<td>Intermediate</td>
</tr>
</tbody>
</table>

The texts were taken from the fourth grade textbooks approved by the Board of Education to suit the level of the students. In order to measure the comprehensibility of the texts, the comprehension scale of the Mistake Analysis Inventory adapted by Akyol (2006) was used. Consequently, 3 basic and 3 in-depth comprehension questions were written for each text. For basic comprehension questions, 0 points were allocated for unanswered or incorrect questions, 1 point for partially answered questions, and 2 points for full answers. For in-depth comprehension questions, 0 points were allocated for unanswered or incorrect questions, 1 point for partially answered questions, 2 points for expected but incomplete answers, and 3 points for full and effective answers (Akyol, 2006).

Data Collection and Procedures

In the preparation phase of the study, the researcher scanned fourth grade Turkish textbooks. A text pool was thus created with selected texts from these books. The selected texts were then scanned and computed. Fourteen of the texts in the pool were removed as their readability score was above 70. On the other hand, 27 other texts were also removed from the pool as their score increased by less than 10 points during the simplification process. Among the remaining texts, the two closest were selected based on their readability scores.

The texts have been simplified in terms of sentence length by paying attention to context. The simplification process was based on the principle of shortening sequential sentences by using full stops. Following this, the readability of the texts was calculated via Flesch's Ease of Reading Formula adapted into Turkish by Ateşman (1997). The two variables in the formula are average word and sentence lengths. These averages are calculated by counting all syllables, words and sentences in the text. Then, the number of syllables is divided by the number of words to find average word length, and the average number of words is divided by the average number of sentences to find average sentence length. Online applications were used to count syllables, words and sentences in texts. The accuracy of different syllable, word and sentence calculation pages was tested as follows:
The researcher counted the syllables, words and sentences of a selected text, then the computed text was uploaded to different syllable, word and sentence calculation pages and the data were recorded. The webpages overlapping with the data obtained by the researcher were used to count the syllables, words and sentences in the texts. Internet sites were used to calculate the number of syllables (HesaplamaOnline, 2019), words (Hesaplamalar, 2019) and sentences (eHesaplama, 2019) in the texts.

The opinions of two experts from Düzce University’s Faculty of Education, Elementary Education Department and one from the Department of Turkish Education were obtained about the texts. Other than these experts, the views of a linguist were also obtained. The simplified texts were revised in line with expert views. The resulting texts were finalized with the help of the Turkish Education expert again. As a last step, expert opinion was gathered once again on the final simplified texts to rule out any contextual errors.

After deciding on the elementary school where the study was to be conducted, a pre-test was applied to all fourth grades in the school. After the two-day pre-test, four fourth-grade classes that did not vary significantly in their comprehension scores were randomly assigned to experimental and control groups.

The implementation phase of the study was completed in four school days. It was conducted by the researcher with the thought that there might be teacher competition in the school. Before the implementation, the researcher introduced himself to the students and informed them that the scores they receive would not be entered into the e-School system. During the implementation, care was taken for each student to read the text once and the readers were asked to turn the paper over upon completion.

There are also foreign students whose mother tongue is not Turkish in the classrooms. In order not to make these students feel their differences, the students were included in the implementation process. However, the data of these students were not included in the analysis of the research. Therefore, research data were collected from students whose mother tongue was Turkish, who did not receive any special education, and who showed normal development. A total of seven students, two inclusion students in experimental group 1, one foreign student in experimental group 2, two foreign students in control group 1, and one foreign student and one inclusion student in control group 2 were removed from the study.

On the other hand, the texts used in the study were applied crosswise to the experimental and control groups. The reason for this situation is to prevent the participants from gaining familiarity with the texts by encountering two different versions of the same text.

**Data Analysis**

For normality analysis, the study made use of the Lilliefors-corrected Kolmogorov-Smirnov Test (K-S). According to the results obtained from the normality test, Paired Samples T Test was used to analyze the data with normal distribution, and Wilcoxon Signed Ranks Test was used to analyze the data that did not show normal distribution. As the scores from the comprehension test given to determine group equivalence were normally distributed, One Way ANOVA Test was used to compare the 4 groups. In these tests, significance value was set as 0.05. These tests were conducted using the SPSS 24 package (IBM Corp., 2016)

In order to ensure reliability in the study, some of the comprehensibility data were scored by two raters. To do so, comprehension data from 50 randomly selected participants were used. This procedure was not applied to all the data for time and funding reasons. After this process, the correlation method was used to ensure inter-rater reliability. As the comprehension data of 50 participants did not show normal distribution, the Spearman Brown Rank Differences Correlation Test was conducted in order to reveal the relationship between the two raters. According to the test results,
a strong and positive significant relationship was found between the two raters ($r (48) = .88$, $p = .00$, $p < .05$)

**FINDINGS AND INTERPRETATIONS**

The K-S Test was used to measure the normality of the equivalence test data. The results showed that the comprehension scores of experimental group 1 $D (30) = 0.200$, $p > .05$, experimental group 2 $D (32) = 0.200$, $p > .05$, control group 1 $D (29) = 0.200$, $p > .05$ and control group 2 $D (32) = 0.200$, $p > .05$ showed normal distribution. Based on the K-S Test results, One Way ANOVA was used to compare the comprehension scores of the groups.

**Table 2: One Way ANOVA Test Results According to the Comprehension Scores of the Groups**

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>$\bar{x}$</th>
<th>$S$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group 1</td>
<td>30</td>
<td>8.27</td>
<td>3.151</td>
</tr>
<tr>
<td>Experimental Group 2</td>
<td>32</td>
<td>8.00</td>
<td>2.383</td>
</tr>
<tr>
<td>Control Group 1</td>
<td>29</td>
<td>8.00</td>
<td>3.128</td>
</tr>
<tr>
<td>Control Group 2</td>
<td>32</td>
<td>8.56</td>
<td>2.514</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>8.21</td>
<td>2.777</td>
</tr>
</tbody>
</table>

As presented in Table 2, the ANOVA test ($F (3, 119) = 2.87; p > .05$) which was conducted to see if there was a statistically significant difference between the groups revealed no significant difference in terms of comprehension scores. It may therefore be stated that the experimental and control groups were equivalent to each other at the onset of the study.

**Findings and Comments on the First Sub-Problem**

The comprehensibility of the texts was measured by first applying the original version of the *Bicycles* text to experimental group 1, followed by the simplified version of the *Mysterious Creatures* text. While the *Bicycles* text $D (30) = .010$, $p < .05$ did not show normal distribution, the *Mysterious Creatures* text $D (30) = .200$, $p > .05$ did. For this reason, Wilcoxon Signed Ranks Test was used to compare the two related measurements.

**Table 3: Comprehensibility of Informative Pretest-Posttest Texts Applied in Experimental Group 1**

<table>
<thead>
<tr>
<th>Bicycles (Original)/Mysterious Creatures (Simplified)</th>
<th>n</th>
<th>Mean of Ranks</th>
<th>Sum of Ranks</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensibility</td>
<td>20</td>
<td>14.78</td>
<td>295.50</td>
<td>-3.60</td>
<td>.000*</td>
</tr>
<tr>
<td>Comprehensibility</td>
<td>5</td>
<td>5.90</td>
<td>29.50</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Comprehensibility</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*$p<.001$*

As shown in Table 3, experimental group 1 read the original version of the *Bicycles* text, which ranks as difficult with a readability score of 42.27. Following this, they read the *Mysterious Creatures* text that was simplified by the researcher to a readability score of 61.20. The
comprehensibility test revealed a significant difference between the comprehensibility of the high and moderate difficulty texts ($z = -3.60$, $p < .05$). The mean score of students whose comprehension of decreased between the readings was 14.78, while the mean score of students whose comprehension increased was 5.90. Based on these results, it may be inferred that the text with a low readability score is more comprehensible than the text with a higher score.

**Findings and Comments on the Second Sub-Problem**

In experimental group 2, the original version of the *Mysterious Creatures* text and then the simplified version of the *Bicycles* text were implemented to measure comprehensibility. Neither *Mysterious Creatures* $D (32) = .015$, $p < .05$ nor *Bicycles* $D (32) = .036$, $p < .05$ showed normal distribution. For this reason, the Wilcoxon Signed Ranks Test was used to compare the two related measurements.

**Table 4: Comprehensibility of Informative Pretest-Posttest Texts Applied in Experimental Group 2**

<table>
<thead>
<tr>
<th>Mysterious Creatures (Original)/Bicycles (Simplified)</th>
<th>n</th>
<th>Mean of Ranks</th>
<th>Sum of Ranks</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>23</td>
<td>16.57</td>
<td>381.00</td>
<td>-4.08</td>
<td>.000*</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>5</td>
<td>5.00</td>
<td>25.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .001$

According to Table 4, experimental group 2 read the original version of the *Mysterious Creatures* text, which ranks as difficult with a readability score of 48.72. Following this, they read the *Bicycles* text that was simplified by the researcher to a moderate level with a readability score of 61.02. According to the test results shown in the table, a significant difference occurred between the comprehensibility of the text with moderate difficulty and that with high difficulty ($z = -4.08$, $p < .05$). While the mean rank of the students whose comprehension decreased from the first text to the second was 16.57, that of students whose comprehension increased was 5.00. Based on these results, it may be argued that the text with a low readability score is more comprehensible than the text with a higher score.

**Findings and Comments on the Third Sub-Problem**

The comprehensibility and consistency of the texts were tested by first applying the *Bicycles* text, followed by the *Mysterious Creatures* text in control group 1. Both the *Bicycles* text $D (29) = .081$, $p > .05$ and the *Mysterious Creatures* text $D (29) = .200$, $p > .05$ showed normal distribution. Therefore, the Associated Samples T Test was applied to compare the two related measurements.

**Table 5: Comprehensibility of Informative Pretest-Posttest Texts Applied in Control Group 1**

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>ss</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycles (Simplified)</td>
<td>29</td>
<td>7.38</td>
<td>2.25</td>
<td>28</td>
<td>-1.28</td>
<td>.211</td>
</tr>
<tr>
<td>Mysterious Creatures (Simplified)</td>
<td>29</td>
<td>8.10</td>
<td>2.67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 shows that the comprehensibility and consistency of the texts were tested in control group 1 by applying the simplified versions of *Bicycles* whose readability score was 61.02 and *Mysterious Creatures* whose readability score was 61.20, both showing a moderate difficulty level. According to the test results presented in the table, there is no significant difference between the comprehensibility of the moderately difficult texts *Bicycles* ($M = 7.38$, $SS = 2.25$) and *Mysterious Creatures* ($M = 8.10$, $SS = 2.67$) ($t (28) = - 1.28$, $p > .05$). These results showed that the texts
simplified by the researcher were consistent. It may therefore be claimed that the changes in the experimental groups were not random but caused by manipulating the readability of the texts.

**Findings and Comments on the Fourth Sub-Problem**

The comprehensibility of the texts was measured by applying the the original versions of the *Bicycles* and *Mysterious Creatures* texts in control group 2. While the *Bicycles* text $D (30) = .057, p > .05$ showed normal distribution, the *Mysterious Creatures* text $D (30) = .026, p < .05$ did not. For this reason, the Wilcoxon Signed Ranks Test was utilized to compare the two related measurements.

**Table 6: Comprehensibility of Informative Pretest-Posttest Texts Applied in Control Group 2**

<table>
<thead>
<tr>
<th>Bicycles (Original)/Mysterious Creatures (Original)</th>
<th>n</th>
<th>Mean rank</th>
<th>Sum of ranks</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Rank</td>
<td>14</td>
<td>14.93</td>
<td>209.00</td>
<td>-.086</td>
<td>.388</td>
</tr>
<tr>
<td>Positive Rank</td>
<td>12</td>
<td>11.83</td>
<td>142.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to Table 6, the comprehensibility of the texts was tested in control group 2 by applying the original versions of *Bicycles* whose readability score was 42.27 and *Mysterious Creatures* whose readability score was 48.72, both showing a high difficulty level. Based on the results given in the table, there was no significant difference between the comprehensibility of the *Bicycles* and *Mysterious Creatures* texts, both of which had a difficulty level ($z = -.086, p > .05$). While the mean rank of the students whose comprehension decreased from the *Bicycles* text to the *Mysterious Creatures* text was 14.93, that of students whose comprehension increased was 11.83. This revealed that the original texts were consistent. Here, too, it may be argued that the changes in the experimental groups were not random but caused by manipulating the readability of the texts.

**RESULTS AND DISCUSSION**

The main purpose of this study is to determine the effect of readability of texts on comprehensibility. The findings show that the readability levels of the texts are not as effective as thought on the comprehensibility levels of the texts. Sentences in the texts used in the study were shortened while paying attention to context. The readability of the selected and shortened texts was calculated with the readability formula adapted to Turkish by Ateşman (1997). In this way, an original text and an easier version as depicted by its readability score were obtained. The results showed that the original (more difficult) versions of the texts were more comprehensible than the versions simplified by the researcher. In other words, long sentences are more comprehensible than short sentences. These results contradict those of previous studies in the literature which claim that short sentences are more comprehensible than long sentences (Benjamin, 2012; Bezirci & Yılmaz, 2010; Clifton, Staub, & Rayner, 2007; Coke, 1973; Çifçi, Çeçen & Melanlıoğlu, 2007; Durukan, 2014; Elli, 2011; Güven, 2010; Güyer et al., 2009; İskender, 2013; Jongsma, 1971, p.28; Karatay, Bolat and Gungör, 2013; Küçükahmet, 2011; McLaughlin, 1969; Mirzaoğlu & Akın, 2015; Okur & Arı, 2013; Özbek & Ergül, 2018; Tekbıyık, 2006; Temur, 2002, 2003; Tosunoğlu & Özlük, 2011; Ulusoy, 2009; Yazıcı & Yeşilbursa, 2007; Zorbaz, 2007). According to Budak (2005), it is hard to comment on the difficulty level of texts whose readability is calculated with the variables of mean sentence and word length. In addition, Stevens et al. (1992) report that readability formulas based on sentence length assume that a longer sentence will be more difficult to comprehension than a short one, but that this may not always be the case.

There are opinions in the literature that reading materials with high readability will also have high comprehensibility (Ateşman, 1997; Bezirci & Yılmaz, 2010; Bormuth, 1967; Chall, 1988; Dreyer, 1984; Fry, 2002; Güyer et al., 2009; Kalin & Aydemir, 2017; Köse, 2009; McLaughlin, 1969;
The results of the present study do not parallel this common view in the literature. This may be attributed to two different reasons. The first is the difference in the focus points of readability and comprehensibility. A big majority of the readability formulas in the literature focus on the word or sentence means when calculating text readability (Asem, 2012; Ateşman, 1997; Bezirci & Yılmaz, 2010; Davison, 1988; Fry, 2002; Gallagher et al., 2012; Kong, 2009; Okur and Ari, 2013; Stevens et al., 1992; Tekbıyık, 2006; Zorbaz, 2007), comprehensibility, on the other hand, focuses on semantics (Baş & Yıldız, 2015; Fry, 2002; Kasule, 2011; Puurtinen, 1998), reader and text characteristics (Dale & Chall, 1949; Jones, 1997; Kasule, 2011), and cohesion (Coşkun, 2005).

The second reason involves certain factors that highly affect comprehensibility but are ignored by readability formula. These factors are the logical pattern of the text and the pictures used (Fry, 2002), the reader's interest, motivation and language skills (Ateşal, 2013; Courtis, 1987; Oakland & Lane, 2004; Stevens et al., 1992; Wissing et al., 2016; Yazıcı & Yeşilbursa, 2007), vocabulary (Yazıcı & Yeşilbursa, 2007), background information (Marshall, 1979; Oakland & Lane, 2004; Özdemir, 2016; Pishghadam & Abbasnejad, 2016; Stevens et al., 1992; Zakaluk & Samuels, 1996), and context (Armbruster, Osborn, & Davison, 1985; Harrison & Bakker, 1998; Marshall, 1979).

The results of the present study show that the readability measured by formulas is not as effective as it is believed to be in determining whether a given text or reading material is comprehensible. Asem (2012) also concluded that readability formulas yield inconsistent results about comprehensibility. In addition, many researchers criticize readability formulas for yielding inconclusive results (Asem, 2012; Ateşman, 1997; Bargate, 2012; Chall, 1988; Çepni et al., 2002; Gallagher et al., 2012; Geçit, 2010; Köse, 2009; Okur et al., 2013; Stokes, 1978; Tekbıyık, 2006; Topkaya et al., 2015; Turan & Geçit, 2010; Ulusoy, 2009).

Contrary to the results of previous studies and definitions of readability in the literature that reading materials shown to be readable by formulas are also comprehensible (Ateşman, 1997; Bezirci & Yılmaz, 2010; Bormuth, 1967; Chall, 1988; Dreyer, 1984; Fry, 2002; Kalın & Aydemir, 2017; Köse, 2009; McLaughlin, 1969; Mert, 2018; Mirzaoğlu & Akın, 2015; Özbek & Ergül, 2018; Richards, Platt & Platt, 1992; Tekbıyık, 2006; Yalın, 1996; Zamanian & Heydari, 2012), the present study has revealed that this may not always be the case. As documented by Puurtinen (1998), readability depends on the abilities of the reader and the characteristics of the reading materials.

In line with the results of the study and the literature discussed, several recommendations were made for implementation and research. The first of these recommendations is to consider the perception level of readers, instead of using methods that ignore reader characteristics, when choosing reading materials. At the same time, publishers and authors are recommended to focus on the appropriateness of reading materials to the level of the reader rather than the score obtained from readability formulas. Finally, readability formulas focus on variables such as the ratio of mean word and sentence length in the syntactic structure of reading materials to difficult words. As this leads to inconsistency in matching the reader with the text, researchers are recommended to focus on the reader in the formulas they develop.

**LIMITATIONS**

The most serious limitation of the study is that it only makes inferences about the comprehensibility of texts whose readability were calculated by means of formulas. Therefore, the conclusion in the study that “texts that are readable may not always be comprehensible” does not include readability estimates made by using a cloze test, the five finger technique, or various rubrics.

The study was also limited to fourth grade texts and students. Although it could have covered all the levels included in the formula adapted to Turkish by Ateşman (1997), the fourth grade was chosen due to potential problems with time and costs.
The final limitation of the study is that the groups were formed earlier in the school system due to the class structure at schools. As a result of biased grouping, experimental and control groups may have matured differently during the study, consequently posing a disadvantage to internal validity (Karasar, 2012). Therefore, caution needs to be exercised when generalizing the data.

REFERENCES


Temur, T. (2002). İlköğretim 5. sınıf Türkçe ders kitaplarında bulunan metinler ile öğrenci kompozisyonlarının okunabilirlik düzeyleri açısından karşılaştırılması. (Yayılmamış


Analyzing Teacher and Parent Views on the First Literacy Process During the Covid-19 Pandemic*

Başak Kasa Ayten
İnönü University

Murat Ercan
Ministry of National Education

Abstract

This study aims to analyze the opinions of primary school teachers and parents about the first literacy process in the 2020-2021 academic year under the influence of the Covid-19 pandemic. The recruits were the 1st-grade teachers in the city center of Malatya for the 2020-2021 academic year and the parents of the students in these classes. The recruits comprised 11 primary school teachers and 31 parents selected by criterion sampling of the purposeful sampling methods. The qualitative research tradition was adopted in the study. The research was designed as a case study. A semi-structured interview form was used as a data collection tool, and the data were analyzed through content analysis. The analysis results were categorized into four groups. It was found that teachers had difficulties in the distance education process and could not actively involve students during the courses compared to face to face education. It was stated that teachers, students, and parents experienced adaptation problems during the pandemic and preferred in-person education instead of distanced methods. It was concluded that the parents preferred continuing literacy activities from home via distance education for hygiene during the Covid-19 pandemic, and they supported face to face education after this process. It was suggested that in-service training would be helpful to teachers for literacy education during the Covid-19 pandemic, besides the technological support for distance education infrastructure and guidance activities based on parent-teacher cooperation.

Keywords: Covid-19 Pandemic, Literacy Teaching, Teachers, Parents, Distance Education

DOI: 10.29329/ijpe.2022.426.19

* This study was generated from the master's thesis of the second author, which was conducted under the supervision of the first author in the Department of Primary School Education, Institute of Educational Sciences, and İnönü University.

---

1 Başak Kasa Ayten, Assist. Prof. Dr., Faculty of Education, İnönü University, ORCID: 0000-0001-5926-3380

Correspondence: basak.kasa@inonu.edu.tr

2 Murat Ercan, Ministry of National Education, ORCID: 0000-0001-9489-1200
INTRODUCTION

The first literacy is called the stage in which the individual transitions to the written and oral language. This is the first literacy period when a student can express oneself orally, use the symbols of the written language, and transfer what is heard into writing (Ferah, 2004). Primary literacy education is a language teaching process that starts from the first year of elementary school and aims to gain reading and writing skills with the support of the family (Baş, 2006). Listening, speaking, reading, and writing skills are developed as a whole in this process. The individual starts primary school with experiences gained from family and environment in both comprehension and expression skills. With certain skills in oral communication, the individual tries to develop the written expression skills in the first reading and writing process. Reading and writing skills, essential factors in successful learning, also ensure the permanence of emotions, thoughts, and knowledge. The basis of primary school ages includes literacy skills in this sense (Çaydere, 2010).

Language development starts in the mother's womb and advances with listening and speaking skills from birth until the school period (Babayiğit, 2019). The reading and writing skills are added to the language development process with literacy teaching. Natural language acquisition in pre-school continues in a planned way in the first literacy process, through which reading and writing skills are tried to be gained from the 1st grade of primary school, by systematic and dependent on a program (Sağırlı, 2015). Literacy skills, which progress in a planned and programmed way with the individual's involvement in formal education, are the primary skills they should have in their life-long learning (Özdemir, 2015). The basic skills acquired in this period are fundamental in shaping one's professional and social life.

The development of skills such as using Turkish correctly and effectively, lifelong learning, communication, decision making, and problem-solving in the first literacy process are also significant (Ministry of National Education [MNE], 2009, p. 232). Reading and understanding the texts, expressing feelings and thoughts in writing and verbally, writing by the rules, effective communication with the environment, and enjoying learning Turkish are among the primary literacy teaching goals (Çelenk, 2007, p. 32). The first literacy process can be described as the initial step in the multi-faceted individual development, which is organized according to the interests and needs of the students.

Several literacy methods are used to achieve the purpose of the first literacy process. Each country determines its literacy method by its literacy purposes, alphabet structure, and demographic characteristics. The reading and writing teaching has been conducted with the sound-based sentence method in Turkey since 2005. The voice-based first literacy teaching approach is performed in 3 stages. First, preparation for first literacy, first literacy initiation and progress, and independent reading as the third. The listening exercises, finger, hand, and arm muscle development activities, painting, and drawing exercises are concluded during the first reading and writing preparation stage. First, literacy and progress is the stage through which the teaching of sounds begins, the processes of sensing, recognizing, distinguishing sounds are achieved, then sounds are brought together to syllables, syllables to words, words to sentences, and finally, texts. The independent literacy process starts after all the sounds are taught, and reading exercises are conducted for at least two weeks to ensure fluent reading (MNE, 2019).

Certain misconceptions in this process in which the first literacy skills are developed might continue for years. The first literacy skill, effective in literacy and other life stages, must be acquired correctly and understandably. Misconceptions regarding notebooks, holding a pen, and writing letters can pose difficulties to correct in the future. It becomes necessary to spend this process in an organized way with the proper planning for literacy. However, learning environments may differ in the education and training process. Face to face education can also be conducted remotely due to geographical distances, extraordinary circumstances, or socio-economic reasons. Besides, education and training activities can be performed remotely during and after natural disasters, pandemics, and extraordinary situations. The first literacy activities can be conducted in another environment through various
technological tools apart from the face to face education environment in such cases within a planned manner.

The Covid-19 pandemic outbreak in Wuhan, China, in late 2019 has affected the whole world since March 2020 and caused education to be significantly affected and conducted remotely. The changes in the digital media and learning environments with the Covid-19 pandemic forced Turkey to introduce some changes regarding education in March 2020. Although it was said that the first break would last three weeks, it was decided that the second semester of the 2019-2020 academic year would be continued with distance education due to the high number of cases. The education period continued through the distance education model created with rapid planning (Eken, Tosun, and Tuzcu Eken, 2020). Students, teachers, parents, and administrators were affected by this change on March 23, 2020, and tried to adapt to the digitalized education process. The education activities starting from kindergarten, primary schools, secondary schools, and universities were transformed in a short time as distance education was implemented (Sirer, 2020). The educational content of the Ministry of National Education was conveyed through television, and the internet was accessed free of charge since then. The students connected to the Education Informatics Network (EIN) through television and the internet the curriculum sections that were left incomplete were thought through these organs. The student and teacher interactions, teaching methods, and techniques have also changed with distance education.

One of the tools that primary school teachers utilize to develop technical skills and methods regarding the first reading and writing process is digital products. Altunkaynak and Çağimlar (2020) asserted that primary school teachers are at a moderate level using digital products. The use of digital products in the literacy process with distance education has become essential considering the Covid-19 pandemic. Furthermore, the lack of technological infrastructure and equipment, especially the problems in the internet connections of the primary school teachers, the inability of objective evaluations, completing the learning process, lack of detailed examinations on the course material, lack of opportunities to enjoy the activities, teacher’s active and students' passive states, lack of possibilities to observe individual differences were the most common issues considering the Covid-19 pandemic (Fauzi & Khusuma, 2020; Kasa Ayten, 2021; Yurtbakan & Akyıldız, 2020). It was found that the teachers managing the educational activities during the Covid-19 pandemic experienced some problems and tried to solve these problems. Since parents are also involved in distance education, they must support teachers to overcome this period more comfortably and healthily. It is essential to get stakeholder opinions from teachers and parents regarding the distance education conducted during the Covid-19 pandemic and to be able to reveal the process they experienced.

Distance education was performed together with face to face education in the 2020-2021 academic year after the second term of the 2019-2020 academic year with distance education, as Covid-19 remains a vivid threat. Analyzing the education of the students who are just introduced to the education system shall guide the literature by revealing the pandemic's effects. Examining the literacy process of 1st-grade students during the Covid-19 pandemic and consulting primary school teachers and parents regarding this process shall be effective in helping future education processes.

Thus, the study aims to reveal the primary school teacher and parent views on the literacy process during the pandemic regarding the first literacy process in which distance education and face to face education were performed together during the 2020-2021 academic year. For this purpose, this study investigated the following sub-problems.

1) What are the primary school teachers’ opinions regarding:

- The preparation phase of the first literacy process during the Covid-19 pandemic?
- The initiation and progression phase of first literacy process during the Covid-19 pandemic?

2) What are the parents’ opinions regarding:
- The preparation phase of the first literacy process during the Covid-19 pandemic?

- The initiation and progression phase of first literacy process during the Covid-19 pandemic?

**METHOD**

The qualitative research tradition was followed in the study. The case study model of the qualitative research tradition was adopted. Case studies try to describe an event as it is. It differs from other qualitative research methods by detailed descriptions and interpretations of a unit or a limited system (Hancock & Algozzine, 2006). Yin (2014) argued that a case study has six stages: "planning, design, preparation, collection, analysis, sharing." Accordingly, permission was obtained from the Malatya Provincial Directorate of National Education for the research following the literature review in the planning stage. Semi-structured interview forms regarding the first literacy process during the Covid-19 pandemic were prepared to interview teachers and parents. Afterward, two field experts working in primary school teaching and two Turkish teaching experts were consulted. The pilot interview was held with 1 teacher and 1 parent as the forms were finalized.

The recruits were selected through the purposeful sampling methods, namely the criterion sampling method. The criterion used in this sampling method comprised primary school teachers working in the 1st grade of public schools and parents with different socio-economic segments affiliated to the Battalgazi and Yeşilyurt district directorates of national education in Malatya and provided distance education in the 2020-2021 academic year. Teachers' demographic information is available in Table 1.

<table>
<thead>
<tr>
<th>Demographic Features</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
</tr>
<tr>
<td>Education Status</td>
<td></td>
</tr>
<tr>
<td>Graduate</td>
<td>1</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>9</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>1</td>
</tr>
<tr>
<td>Professional Seniority</td>
<td></td>
</tr>
<tr>
<td>5-10 years</td>
<td>2</td>
</tr>
<tr>
<td>11-20 years</td>
<td>4</td>
</tr>
<tr>
<td>21-30 Years</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
</tr>
</tbody>
</table>

As Table 1 illustrates, 3 female and 8 male teachers were recruited. 1 of the teachers was a college graduate, 9 of them were undergraduates, and 1 of them was a postgraduate. Moreover, 2 had experience between 5-10 years, 4 had 11-20 years, and 5 had 21-30 years. Parents’ demographic information obtained before the interviews is provided in Table 2.

<table>
<thead>
<tr>
<th>Demographic Features</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
</tr>
<tr>
<td>Education Status</td>
<td></td>
</tr>
<tr>
<td>Primary School</td>
<td>5</td>
</tr>
<tr>
<td>Secondary School</td>
<td>6</td>
</tr>
<tr>
<td>High School</td>
<td>7</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>2</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>10</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>1</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>13</td>
</tr>
<tr>
<td>Self-Employed</td>
<td>4</td>
</tr>
<tr>
<td>Teacher</td>
<td>10</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
</tr>
</tbody>
</table>
As Table 2 summarizes, 22 of the parent recruits were female, 9 were male. 5 were primary school graduates, 6 secondary school graduates, 7 high school graduates, 2 associate degree graduates, 10 undergraduates, 1 postgraduate. Moreover, 13 of them were housewives, 4 were self-employed, 10 were teachers, and 4 were students.

Data were collected from teachers and parents recruited voluntarily through a semi-structured interview form. First, the interviews were recorded after the teachers and parents approved it with the consent form. After the interviews, the recordings were deciphered and recorded in the computer environment. 3 of the interviews with the teachers were in-person, and 8 were held remotely via Zoom. All parent interviews were conducted remotely using Zoom. The teacher interviews lasted between 14 minutes 22 seconds and 53 minutes 24 seconds, while the parent interviews lasted between 6 minutes 3 seconds and 21 minutes 43 seconds.

The data collected from the teacher and parent opinions were analyzed through content analysis. The content analysis results were classified within themes, and the correlations between them were analyzed. The themes and sub-themes related to the sub-problems of the research were formed with content analysis. The themes categorized by the authors were consulted by the field experts and modified accordingly.

A field expert selected random interviews and confirmed the accuracy of the breakdown of the records for validity and reliability. The coder first started to analyze the data together and then separated and continued the analysis. The analyses were compared as the themes, sub-themes, and categories were formed on similarities. Miles and Huberman's (1994, p. 64) reliability formula was used [Reliability = Agreement / (Agreement + Disagreement)] and the result was .96. Miles and Huberman asserted that reliability scores over .70 indicate that the research is reliable. The themes are supported with examples from student interviews in the findings section. The interviewees are presented with encoded names for confidentiality. Teachers are mentioned as T1, T2, etc., while the parents are mentioned as P1, P2, etc. The validity and reliability were tested through expert opinions regarding deciphering the views and forming the themes, with a sample from the interviews, in-depth parents' opinions, and teachers.

**FINDINGS**

The data analysis was detailed under two headings as parent and teacher opinions.

**Findings Regarding Teachers' Views on the First Literacy Process during the Covid-19 Pandemic**

The findings regarding the teachers' opinions on the first literacy process during the Covid-19 pandemic are presented with two tables. Table 3 illustrates “Teachers' Views on the Preparation Phase,” and Table 4 presents “Teachers' Views on the First literacy and Progression Phase.”

**Findings Regarding Teachers' Opinions on the Preparation Phase**

One of the essential steps in the first literacy phase is preparation. Activities performed in the preparatory phase affect the whole literacy process. The teachers' opinions regarding the preparation stage in the first literacy process during the Covid-19 pandemic period are available in Table 3.
Table 3. Teachers’ Views on the Preparation Phase

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Category</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting Acquainted</td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Briefing</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Identifying Developmental</td>
<td>Cognitive</td>
<td>Preliminary Information Checks</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Traits</td>
<td>Affective</td>
<td>Motivation</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Psychomotor</td>
<td>Pencil Grip</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Muscle Development Deficiencies</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Preparatory Activities for</td>
<td>Listening</td>
<td>Playing Songs</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Students</td>
<td></td>
<td>Fairy Tale, Story Reading</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reading Poetry</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cartoons and Animations</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nursery rhymes</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dough Playing</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Latching</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Puzzle</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Legos</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cut-Paste</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building with Mud and Sand</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rope Shaping</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sportive Activities</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Musicgram</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Painting Activities</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line Exercises</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Preparatory Activities for</td>
<td>Painting and Line Exercises</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td>Raising Awareness</td>
<td>The General Process</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Literacy Process</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan Preparation</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3 demonstrates that the teachers' opinions regarding the first literacy preparation stage were grouped in “Preparatory Studies for Students” and “Preparatory Studies for Parents” themes. There were 4 sub-themes under the preparatory work for the student theme: Getting Acquainted (f=7), Briefing (f=5), Identifying Developmental Traits (f=19), and Events (f=67). Moreover, there were 2 sub-themes as Raising Awareness (f=18) and Plan Preparation (f=2), under the preparatory work for parents theme.

*Preparatory Activities for Students* themes refer to the Acquaintance (f=7) activities by primary school teachers. Teachers’ views on this sub-theme are as follows:

“What we did at the beginning of the process, well we contacted parents and students through WhatsApp groups. There were continuous meetings. I had meetings on Zoom. I introduced myself. I instilled confidence in them. I met my students. My students trusted me when they came to school. We started training at school together. We played games together, taught lessons, and created an environment.” (T5).

Teacher T5’s views indicate that teachers primarily conducted meetings with students from a distance through various means of communication for acquaintance activities during the preparation phase. Furthermore, they spent this process with various games and activities for the students to know, trust and adapt themselves.

Briefing activities (f=5), a sub-theme, were held under the *Preparatory Activities for Students* theme. The teachers stated that they informed the students about the process regarding the Covid-19 pandemic. Examples of teachers' views on this are as follows:
“I told them what was going to happen, and I made them believe that we would keep the distance between us, masks, disinfectants and that we would always create a safe environment for the school. We also informed the children in the same way. Every time I went to school, I took photos and showed them what we were going to do.” (T7).

Teacher T7 tried to provide psychological relief to the students by introducing the possible situations they may encounter during the school start process to control the student information about the pandemic under the teacher information sub-theme. There were some concerns about the Covid-19 pandemic among the students starting the 1st grade of primary school, while the primary school teachers tried to motivate them in this sense and propound the situations they will encounter in this process.

Cognitive, Affective, and Psychomotor categories were created within the sub-theme Identifying Developmental Traits under the Preparatory Activities for Students theme. Examples on Preliminary Information Checks in the Cognitive category (f=3), Motivation (f=8) in the Affection category, Pencil Grip (f=6), and Muscle Development Deficiencies (f=2) in the Psychomotor category are as follows:

“Well, I did roll call for the children first. Such as what are the meanings in mathematics, randomly in Turkish, ‘There is a bird flying in the air, do you notice the bird?’ and ‘Are there any trees around?’ To understand whether the children's perception of the outside is open or closed, I first analyzed this, and then we made a general examination of the families.” (T1)

Teacher T1 collected information about the general situation of the parents while taking attendance at the students' prior knowledge at the beginning of the school year. It was tried to measure the students' knowledge status and whether they were cognitively ready for the first literacy process by the teacher coded T1.

“When I look at it, the readiness level of two children and their pencil holding skills were extremely good. He/she can hold a pen and write letters correctly. Some of them started with irregular lines, as we call them, and they had trouble even drawing the irregular lines. So we planned something about holding a pencil and writing skills…” (T5).

The example reveals that teacher T5 monitored the readiness for holding a pencil. It was stated that students with pre-school education did not have problems with pencil grip, but the ones who started their education life with the 1st grade had some difficulties.

The examples regarding the Listening category under the Events sub-theme within the Preparatory Activities for Students such as Listening to Songs (f=4), Reading Tales and Stories (f=6), Reading Poetry (f=3), Cartoons and Animations (f=4), and Nursery Rhymes (f=3) are as follows:

"We utilized the internet for listening exercises. There are the stories I took and read a few of them. Sometimes I used audio videos and stories. There were some very good stories, both suitable for our voices and as normal stories, especially on a few sites such as Okulistik. We listened to the children in a way that they could listen and understand and then tell me. It was very nice.” (T7).

Teacher T9 conducted listening exercises for the preparatory activities to understand the text listened to, concentrate their attention, and think creatively. The majority of the teachers stated that these exercises were significantly beneficial for the student's literacy preparation.

Examples regarding Hand, Arm, and Finger Muscle Exercises category within the Events sub-theme under the Preparatory Activities for Students such as Playing Dough (f=9), Latching (f=1), Puzzle (f=1), Legos (f=1), Cut-Paste (f=3), Shaping with Mud and Sand (f=1), Rope Shaping (f=1), Sportive Activities (f=3), Musicgram (f=1) are as follows:
"They prepared their dough with puzzles, play dough, Legos, or different materials at work. We have included activities like this one where children will do more cut and paste. Moreover, we already did line exercises and hand muscle development exercises for about 3 weeks to 1 month.” (T2)

The explanations of teacher T2 hints that play dough activities contribute to 1st-grade students' muscle development, help them hold pencils, provide 1st-grade students' muscle development, help them provide first, and provide comfort in writing. It was understood that materials besides play dough such as blocks, cut-paste activities, and puzzles were used to help the students develop their hand, arm, and finger muscles in the preparation phase before the sounds are thought.

The examples regarding the Drawing Activities (f=8) and Line Exercises (f=11) within the Painting and Line Exercises under the Events theme for Preparatory Activities for Students are as follows:

“We were leaving copies at the school, and we set up a booth, families came and took them. I have sent them over the phone via WhatsApp. I made a video on how to hold the pen. I told their families that they should not force them and work for half an hour every day, and that was enough.” (T2)

Teacher T2 prepared for the literacy process with painting and drawing activities and made efforts for these activities. It was observed that teachers produce different solutions to deliver activities to students. They also benefited from textbooks and different sources, and the internet in this process. Since this process advanced remotely, parents' help was also sought by teachers. Other teacher opinions also support these statements.

An example for the “Motivational Activities” (f=7) category within Exercises on Affection Traits under the Events theme for Preparatory Activities for Students was:

"When we arrived, we played games, joked around, asked riddles, and applauded together when I put it on the board. We also hung your pictures on the board and tried to motivate such children.” (T1)

Teacher T1 wanted to motivate the students to the school and the Covid-19 process during the orientation period when the students started school and conducted various motivational activities to prevent them from being affected and prepare them emotionally for the literacy process.

Examples regarding the General Process (f=11) and Literacy Process (f=7) within Raising Awareness sub-theme of Preparatory Activities for Parents are as follows:

“I talked to the families on the phone during this process. We gathered them in the schoolyard, and I used a board and told the families about not teaching the letters wrong, how to teach the consonants because they needed to support me at home, especially the mothers who participated in the education a lot.” (T2)

This example by teacher T2 shows that they first met the parents as preparatory work and provided information/guidance about the literacy process. They emphasized the importance of parents and the necessity of teacher-parent cooperation in the first literacy process, especially during the Covid-19 pandemic.

“I said let's prepare the parents well. Understand the homework, at least follow up when we assign something. So don't practice the sounds, don't try to teach. Because misteaching is a potential consequence. For example, the child says 'p' to a sound, brings the letter p and e together, and says 'pe' to it. They teach the wrong syllable or the spelling of the letter, for example. Children mistake the direction of a letter that should bring it from top to bottom in
the wrong way when writing. I frequently informed the parents, especially via WhatsApp. I posted a picture of every activity. For example, I listed the things about what they should do at home.” (T5).

The teacher T5 mentioned that the primary school teachers warned the parents in this regard to prevent the student from being exposed to wrong learning. If a parent, with the student during the distance education process, does not comply with the teacher’s guidance, the mistakes mentioned may become permanent.

Examples regarding the Plan Preparation (f=2) within Preparation to Activities sub-theme of Preparatory Activities for Parents are as follows:

“I was texting the parents early, around seven am. I was making plans for the parents ten minutes before breakfast. I was writing good morning to everyone at seven o’clock. I’m giving the message that I’m ready to start.” (T1)

The primary schoolteacher T1 has made various preparatory studies on preparing a plan for the parents. The primary teacher conducted this as preparatory work to motivate both the student and the parents while providing order.

The Preparatory Activities for Parents When theme, in general, revealed that primary school teachers focused on awareness-raising activities towards parents for the literacy process regarding the raising awareness sub-theme.

**Findings Regarding Teachers’ Views on First literacy and Progression Stage**

The first literacy and progression phase is when the student starts reading/writing letters and syllables following the preparation phase. It can also be called the stage of feeling, recognizing and distinguishing the sound, reading and writing syllables from letters, words from syllables, sentences from words, and reading simple texts. The teachers’ views on the process of first literacy and progressing stages during the Covid-19 pandemic are available in Table 4.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Category</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Activities</td>
<td>Distance Education Activities</td>
<td>Reading Exercises</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Writing Exercises</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reading Comprehension Exercises</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specific Days and Weeks</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Face to Face Education Teaching Activities</td>
<td>Reading Exercises</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Writing Exercises</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reading Comprehension Exercises</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Teachers' Methods and Techniques</td>
<td>Method Techniques Used in Distance Education</td>
<td>Question-and-answer</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Return Demonstration</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narration</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Face to Face Education Methods and Techniques</td>
<td>Return Demonstration</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Question-and-answer</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drama</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Game-based Teaching</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brainstorming</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Materials, Tools, and Equipment</td>
<td>Additional Sources</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Video and Visual Presentation</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Writing Sticks</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Education Sites</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Projection</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Table 4 indicates that the teachers' opinions regarding the first literacy and progression phase are categorized under 5 themes: *Teaching Activities, Teaching Methods and Techniques, Materials, Tools, and Equipment, Experienced Problems,* and *Solutions.* There are sub-themes as Distance Education Activities (f=34) and Face to Face Education Teaching Activities (f=33) under the Teaching Activities theme. Moreover, 2 sub-themes emerged as Distance Education (f=14) Methods and Techniques and Face to Face Education Methods and Techniques (f=15) under Teaching Methods and Techniques theme. Additional Sources (f=11), Video and Visual Presentation (f=6), Writing Sticks (f=2), Education Sites (f=9), and Projection (f=2) were formed under the theme of Materials, Tools, and Equipment theme. The sub-themes of Problems in Distance Education (f=40) and Problems in Face to Face Education (f=33) were constructed under Experienced Problems theme. There were 2 sub-themes as Solutions to General Problems (f=6) and Solutions to Literacy (f=28) under the theme of Solutions.

Relevant examples for categories of Reading Exercises (f=11), Writing Exercises (f=11), Reading Comprehension Exercises (f=11), and Specific Days and Weeks (f=1) related to the Activities Performed in Distance Education sub-theme within the *Teacher’s Activities* theme:

“I received a lot of support from the parents during this process. I received support from the parents as the children only came to school for 2 days and were home for 5 days. Thus they were more active. I asked them to check how long their children studied and their homework. At school, we were able to correct their deficiencies and mistakes in face to face education, but we could not control them from away. Therefore, they sent me videos of the children’s readings and pictures of their works/writings. At least, I monitored whether their writing was beautiful or not, but we could not see whether they misspelled or the letter directions.” (T2)

Teacher T2 revealed that they received help from the parents in the reading and writing activities during the distance education process. They were asked to take photographs for improvements in writing and videos to see progress in reading. Homework checks were also performed in this way. It was observed that other teachers also used the same method.
“For example, we made domestic goods events, etc. Everyone cooked or prepared local goods at home and sent their photos to me. We had our reading festival. For example, I made the letters farewell party for the children. They all held a farewell party to the letters at home with their families. They posted photos of those events. That's how we continued the process.” (T6).

Teacher T6 stated that although s/he was in the distance education process, the exercises were performed on certain days and weeks. It can be asserted that the activities on certain days and weeks help students not to break away from the literacy process as if the face to face education continued.

The following examples are relevant for the categories of Reading Exercises (f=11), Writing Exercises (f=11), and Reading Comprehension Activities (f=11) related to the sub-theme Classroom Teaching Activities under the Teaching Activities theme:

"We did eye-muscle improving activities by expanding a word downwards like ladders. We tried to find a solution that way or draw attention to the letter or syllable. We said let's read this, and you read it, and let someone else read it, so we had your friends read it and listen to it. I wonder if he'll be able to find the mistake.” (T5).

Teacher T5 had the students read the words s/he prepared in the form of stairs to help them understand what they read during the face to face education. The aim was to make other students understand what a student reads while doing this activity, not with only one student but with all students in the class. It was found that the teacher tried to make sense of the reading studies.

"At first, we did literacy activities in face to face education, and then we conducted activities to recognize letters and sounds following the adaptation week. Methods and techniques, apart from conventional methods, we used conditions where the student is active. Then we benefited from the exercises of educational sites such as EBA (Education informatics networks), Morpa, and Okulistik. Moreover, we had children experience it, of course, children can be active in education.” (T4).

Teacher T4 indicated that the student was more active in the face to face education process than in distance education. It has also been revealed that teachers also benefit from the education sites they use during distance education in the face to face education process. Furthermore, it was stated that the teacher-centered lessons during distance education were student-centered in the classroom environment.

Teaching Activities, summarized in Table 4, hints that teachers prioritized reading, writing, and reading comprehension activities in distance education and face to face education. Unlike face-to-face education, it was found that students performed activities from home for certain days and weeks in distance education.

Teaching Methods and Techniques the theme was detailed into the Distance Education Method and Techniques (f=14) with categories such as QA (f=3), Return Demonstration (f=4), and Narration (f=6).

For instance, T9 stated that “I did more screen sharing with children in distance education. I used a typing program myself for the writing of the letters. After that, we used the visuals on the Okulistik site and shared screens using other internet sites, EBA. We wrote it ourselves and showed it to the children so that they could write. The children wrote their texts in the notebook and sent them to me. So, looking at those things, I suggested that they pay more attention to specific letters and write them. I gave feedback again. So we reinforced it with visuals.” (T9). Teacher T9 applied different methods and techniques such as narration and return demonstration in the initial reading and writing process. Since the education was performed remotely, the feedback was sent through technological tools. It can be argued that since the teachers include the student in the process, they prevented boring the student and followed a suitable path for the constructivist approach.
Relevant examples of Return Demonstration (f=5), QA (f=4), Drama (f=2), Game-based Teaching (f=2), Brainstorming (f=1) under Teaching Methods and Techniques theme are as follows:

“Especially, we imagined a story for each letter. Sometimes one student enacted Ela, Lale, and Ali. Moreover, Nalan was Ali’s mother, and she was driving by making a “vroom” sound when they took a ride in the car; we all drove together. So, I focused more on role-playing, return demonstrations, and question-and-answer methods. I significantly utilized these 3 methods. I enabled the children to participate actively in the process. I gave a lot of space to visual materials by co-animating.” (T2)

It can be argued that students participate more actively during the literacy process in the face to face education process compared to distance education, based on teacher T2’s statements. As the distance education process progressed with technological tools and was under the teacher’s control, the students had to follow the teachings from videos. The students progressed this through return demonstration in the face to face education since they were in the center.

The Teaching Methods and Techniques theme revealed that teachers used the narration model in distance education and return demonstration in face to face education. It was observed that teachers often also resort to the QA method in both processes.

The Additional Sources (f=11), Video and Visual Presentation (f=6), Writing Sticks (f=2), Education Sites (f=9), and Projection (f=2) were analyzed under the theme of Materials, Tools, and Equipment theme. The following examples for these sub-themes are:

“I have utilized Çaliskan Arı's 1st grade learning to read and write kit. The parents also bought it, it was conducive. There are the textbooks, we have finished them. They have been very helpful. We have storybooks, I sent them these. Besides, Morpa Kampüs offered beautiful stories, for example, for the feeling of the voice, while it makes one feel, it explicates the sound very well. I took advantage of it. The things we usually did were online.’” (T11)

Teacher T11’s statements indicate that teachers benefit from additional sourcebooks and various educational sites besides the textbooks. It was observed that especially 1st-grade teachers include the first literacy sets in the process frequently. Teacher views revealed that the transfer of the contents of the educational sites to the students by reflecting them on the screen, especially in the distance education process, provided great convenience for feeling and recognizing the students’ voices.

The Materials, Tools, and Equipment theme indicates that 1st-grade teachers benefit from additional sourcebooks and educational sites in the literacy process. They stated that they use them both in distance and face to face education.

Relevant examples for categories of Boring Student (f=4) and Technology Deficiencies (f=7) in the General Problems (f=11) category related to the Problems Experienced in Distance Education (f=40) sub-theme within Experienced Problems theme are:

“They were bored, since sitting in front of the screen for a long time bored them, the primary issue was this. Another problem was that the lack of internet at home in the early days. Children could not attend online lectures. Third, the inadequacy of devices, phones or computers, tablets. Having a couple of siblings, with one or two telephone calls at home, sometimes they attended in turns. They had such troubles.” (T4).

Teacher T4 stated that the students were bored because they were sitting in front of the screen for a long time. Moreover, technological problems and equipment were inadequate due to the number of students studying in the family. Student boredom and lack of technology were among the general problems in the distance education process.
Relevant examples for categories of Reading Exercises (f=7), Writing Problems (f=8), Time-based Troubles (f=3), Participation (f=4), Inability to Correct Mistakes (f=5) and Mislearning (f=2) in the category of Literacy Problems (f=29) under the theme of Problems Experienced in Distance Education (f=40).

“The writing process was like this, and we were getting the child on the board in face to face education, I was showing it. But here I am watching a video, I explain, I show the way of writing, I knew what the child was doing. I was getting them on the board to see if they learned the spelling directions correctly. This was a problem in distance education. The child wrote the letters somehow, but they wrote them in their own way.” (T6).

Teacher T6 mentioned that students could not perform their writing exercises at the desired level by the teacher since they were away from the teacher during the distance education process. Teachers overall opinions indicated that this problem might be overcome more easily in face to face education. The writing problems arise in letter exercises regarding the way and direction of the letter.

“The parent interferes a lot with the child in distance education, and we cannot remove the parent from the equation. This was the biggest problem. We can't identify the child's own information, some parents whispered to the child in the background...” (T3)

Teacher T3 asserted that distance education extended student's learning period about the problems experienced. The same information provided in classrooms at school enables students to put the knowledge into practice directly since there is no intervention. However, parents' intervention causes them to fall behind at both reading and writing in distance education. Because when the family shares the correct information directly with the student, the student shares the newly learned letter or word with the teacher after memorization instead of recognition. The same conditions apply for writing exercises, as the parent completes the homework for the students when they cannot write, which delays the student's learning and writing habits.

The examples regarding Mask Problem (f=4), Avoiding Close Contact (f=4), Increasing Hygiene Measures (f=4) in the category of General Problems (f=12) related to the sub-theme Problems in Face to Face Education (f=34) under the Problems Experienced theme are as follows:

"The teacher made a great effort so that the children do not touch each other regarding all kinds of movements, washing their hands, their pens fell to the ground, numerous complaints, mask changes, hand hygiene, etc. These, of course, doubled the burden of the teacher. (T6).

Teacher T6 mentioned the mask, avoidance of close contact, and hygiene problems during the face to face education process. S/he expressed the teacher's difficulties and responsibilities in adapting the students to the mask-distance-cleaning rules during face to face education. Since there is no mask usage in distance education, this was not a problem.

A relevant example for the Problems Experienced in the Face to Face Education (f=34) sub-theme for the Literacy Problems (f=21) category including the Letter and Syllable Teaching (f=3), Mask (f=1), Problems in Teaching of Letters and Syllables (f=11), and Students' Adaptation to School (f=7), within Problems Experienced theme, is as follows:

"Because there was a mask and a visor, the children could not see my mouth, and I could not show them emphatically the letters in the tongue, teeth, or lips. They could see my face during the online courses but could not when I was at school. I needed to raise my voice more. This was a struggle indeed. Moreover, we repeated the letters about language and tooth structure, for example, during the online lectures.” (T2)

Teacher T2 talked about the problem in teaching letters due to the mask problem in the face to face education process. It was a problem that the students could not see how the letter came out of the
mouth. This activity progressed more quickly because there was no mask use in distance education. Because the student was able to directly observe the way the letter was written and emphasized through the camera.

The Problems Experienced revealed that the teachers stated that the students experienced Problems in Distance Education with their writing activities. This problem was followed by technological deficiencies and family interventions in literacy studies. Regarding the Problems in Face to Face Education sub-theme, teachers had several problems while teaching letters and syllables. Since the literacy exercises coincided with the Covid-19 pandemic, some delays were observed in teaching letters and syllables due to avoiding contact with students. This situation was again augmented by students’ problems adapting to the school during the face to face education period.

Under the Solutions theme, there was an Awards and Reinforcements (f=6) category regarding the General Problems (f=6) sub-theme. The following example is relevant for this category.

“I motivated them by telling that we are going have fun after finishing that. I kept saying we will paint if we finish this, we will start physical education, if we complete this, we will do different activities, and it worked (T6).

This case provided by teacher T6 reveals that s/he found a solution to reward and reinforce students for motivational purposes against their reluctance and boredom in the process. S/he focused the attention of the students in this sense both by drawing and playing games.

Relevant examples for Color Writing in Reading Syllables (f=6), Keeping the Camera and Microphone On in Distance Education (f=2), Parent Collaboration (f=11), Greeting Games (f=3), Providing Feedback with Videos (f=6), Peer Support (f=1), and Rhyme and Poetry Reading (f=3) categories under the theme of Solutions for Literacy (f=28) within the Solutions theme are as follows.

"We had a lot of trouble with writing. The children were writing very badly. I was trying to see through the camera. Since some children's phone and tablet cameras were very old, I could not see their writings. I couldn't make corrections despite the necessity. I experienced this problem a lot, and then I tried to correct their writings by sending a lot of nursery rhymes to the children and having them write rhymes, numbers, and poems. It hasn't been very effective, so it's not as good as when we are in the classroom, but I mean, the writing is bad, the 1st graders' writing particularly bad." (T11)

Teacher T11 argued that s/he wanted help from the parents for students who did not repeat daily in the reading process and expressed potential solutions to the writing problem in this way. Therefore, it might be asserted that the teachers encounter problems in writing rather than reading. They cooperated with the parents and tried to advance the process with the help of various directions and technology. They supported the reading and writing styles of the students with photographs and videos. They drew the students' attention in the syllable teaching by writing the syllables to be read in color, and they also applied for peer support when necessary.

The Solutions to Problems revealed that the teachers provided solutions to the problems they experienced in this process related to the Solutions for Literacy sub-theme. It was observed that they found solutions to the problems experienced, especially with the cooperation of the parents, the parents provided feedback with videos and photographs, and the parents collaborating with the primary schoolteacher have improved considerably in the student's literacy exercises.

Findings Regarding Parents’ Views on the First Literacy Process during the Covid-19 Pandemic

The findings on the parents’ opinions on the first literacy process during the Covid-19 pandemic are presented with two tables. Table 5 demonstrates that parents’ opinions on the preparation
phase are grouped under two themes: Preparatory Activities for Distance Education and Preparatory Activities for Face to Face Education. Moreover, Table 6 summarizes parent opinions regarding the first literacy and progression phase with 3 themes: Reading, Writing, and Problems Experienced.

**Findings Regarding Parents' Opinions on the Preparation Phase**

The preparation stage, an essential part of developing a positive attitude towards the first literacy process, affects parents and students. Parents’ views on the preparation for the first literacy phase during the Covid-19 pandemic are available in Table 5.

**Table 5. Parent Opinions on the Preparation Phase**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Category</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory Activities for</td>
<td>Planning</td>
<td>Education Sites</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Distance Education</td>
<td></td>
<td>Additional Sources</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Video, Images, Material</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overcoming Deficiencies</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creating a Classroom Environment</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stationery Materials</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technological Needs</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Developmental</td>
<td>Availability</td>
<td>Pre-school education</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Features</td>
<td></td>
<td>Hand, Arm, and Finger</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Letter and Number</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Knowledge</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intelligence Games</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painting and Line</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Exercises</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Associating Literacy</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>with Daily Life</td>
<td></td>
</tr>
<tr>
<td>Preparatory Activities for</td>
<td>Raising Awareness</td>
<td>Social Distance</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Face to Face Education</td>
<td></td>
<td>Hygiene Measures</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mask Usage</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

The parent opinions regarding the first literacy and progression stages were grouped under two themes: Preparatory Activities for Distance Education and Preparatory Activities for Face to Face Education. The Preparatory Activities for Distance Education theme have sub-themes of Planning and Developmental Features. The categories of Additional Resourcing (f=35) and Overcoming Deficiencies (f=25) were formed under the Planning sub-theme, as the Availability (f=42) category was designed for the Developmental Features sub-theme. The Raising Awareness sub-theme under Preparatory Activities for Face to Face Education has Awareness Raising (f=18) category. The following examples are relevant to the Additional Resourcing (f=35) category for the Planning (f=60) sub-theme under the Preparatory Activities for Distance Education theme.

"The material was a literacy kit called Triangle Education that our teacher bought. We followed him. It was quite comprehensive, as a weekly fascicle, and supportive in different disciplines such as mathematics, life sciences, and literacy. These are things that go cumulatively, you cannot rush it. The teacher already informs weekly about which pages will be followed in which fascicles. We followed it from there and progressed daily. The teacher also gave homework from the textbook, and we tried to complete them.” (P19)

Parent P19 mentioned that supplementary resources were also used upon the teacher’s suggestion besides the textbooks during the preparation process. Since the transition to free reading and writing has not been achieved yet, preparations for reading and writing were conducted step by step with the teacher’s suggestion.

"We deciphered all of the toys into text so that they could be used at home first, so if there were blocks, we wrote words and letters on them, we were trying to make an activity at home, well, from bingo to writing cards. Then we found pictures, for example, I downloaded some
from the internet, pictures that I thought might be meaningful. We showed those pictures to the children and started to talk about them and improve their vocabulary. There were activities given by our teacher, and we used them regularly every day. Besides, their books and the books we bought as extras were for exercises and short activities with the reading and writing content. However, they had better reading material. Because the children attended the online lesson for 6 hours and they exhausted all the screen, lesson, literacy times there. They were very bored because if we didn't play afterward, they wouldn't come near us." (P23)

Parent P23 stated that this process was supported with several additional visuals and games so that students would not get bored with distance education. This parent also improved the process with the works given by the teacher by grasping the student's attention with the visuals obtained from the internet and by discipline. S/he tried to increase the student's motivation by using the child's toys at home as course material.

Here is an example of the Overcoming Deficiencies (f=25) category of the Planning (f=60) sub-theme under the Preparatory Activities for Distance Education theme:

“I can say that I have prepared a quiet environment, established an internet connection to my house, changed my phone so that my child can access education with comfort, we do not have internet problems, and I cut our own expenses and spent it on their education. I tried to transform the house, the room environment, into a classroom, I can put it that way. For example, I wanted the room environment to be the same as the classroom environment, so I bought a desk, a chair, and books and helped him use his notebooks regularly.” (P1)

Parent P1 implied that the student's room was tried to be transformed into a classroom environment in the preparation process for distance education, and in this sense, the necessary technological equipment was provided. All these preparatory steps can be considered as positive developments for distance education, as they increase the student's motivation towards the lessons. The following example is relevant to the Readiness (f=42) category of the Developmental Traits sub-theme under the Preparatory Activities for Distance Education theme:

“S/he knew rhythmic numbers and could count numbers from 1 to 100. S/he knew the shapes, most of the letters. S/he was even reading some things, knew some words, his/her own name, brother's name, s/he was trying to write. S/he was asking a lot, so I wouldn't teach too much so that s/he wouldn't be confused and learn in the classroom, frankly, I wasn't too involved. I was trying not to teach because I saw the problems of this in some of my students before. My own observations indicate that his/her readiness level was a bit better than the peers.” (P30)

This example by parent P30 showed that the student acquired the knowledge of letters and numbers before starting the literacy process. Although s/he is at a good level compared to his/her peers, s/he was not fully passed on to literacy by his/her parents before starting primary school. This process relied on prolonged literacy teaching left to the primary schoolteacher to have healthier progress.

The Preparatory Activities for Distance Education theme, in Table 5, shows that students' parents utilized additional sourcebooks for the Planning sub-theme. They also benefited from educational sites in the process. As the technological infrastructure belonging to the category of overcoming deficiencies was satisfied, the readiness category related to the Developmental Features sub-theme revealed that the majority of the students received pre-school education and had letter-number knowledge.

The following examples are helpful to shed light upon the category of Social Distancing (f=3), Hygiene Precautions (f=9= and Mask Use (f=6) regarding the Awareness sub-theme (f=18) under the Preparatory Activities for Face to Face Education theme:
“First of all, we tried to take care of his/her health. We warned him/her and emphasized what s/he should do in the school environment should do without a mask or when s/he goes to the washrooms. Because it is 1st grade, we said do whatever your teacher says, with your teacher. Don't leave his/her side. We gave feedback to the child about the behaviors and attitudes that should be treated rather than the teaching context.” (P26)

This example indicates that parent P26 conducted awareness-raising activities on hygiene for the student before the face to face education. It can be argued that parents paid attention to mask, distance, cleanliness, and health issues and show their uneasiness when sending their students to school.

Table 5 demonstrates that the parents made their children aware of hygiene measures and warned about mask usage for the Preparatory Activities for Face to Face Education. It was also revealed that they focused on literacy exercises in the distance education process and on the mask-distance-cleaning issue during the face to face education period.

Findings Regarding Parents' Views on First literacy and Progression Stage

The first literacy and progress phase is the period after the preparation phase, where the student learns the letters and tries to read the texts. The parent support is quite substantial in helping the student to read and write at home. Parents' views on the process of first literacy and progressing stages during the Covid-19 pandemic are available in Table 6.

Table 6. Parents' Views on First literacy and Progression Stage

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Category</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>Reading in Distance Education</td>
<td></td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reading in Face to Face Education</td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td>Writing in Distance Education</td>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reading in Face to Face Education</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Experienced Problems</td>
<td>Problems in Distance Education</td>
<td>Common Issues</td>
<td>Absence of Classroom Environment</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Problems in Literacy</td>
<td>Distraction</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motivation</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student-Parent Conflict</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Problems in Face to Face Education</td>
<td>Parent's Conceptual Errors</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mistakes in Writing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Common Issues</td>
<td>Hygiene Issue</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Problems in Literacy</td>
<td>Lack of Reinforcers</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental Comparison</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 demonstrates parents' opinions regarding the first literacy and progression stages grouped under Reading and Writing and Experienced Problems themes. The reading theme was divided into Reading in Distance Education and Reading in Face to Face Education sub-themes. Relevant examples for these themes are as follows:

“The lack of school attendance during this pandemic, teaching letters through distance education, individual exercise sessions via Zoom and hence the boredom in the child slowed the reading speed.” (P25)
The example provided by parent P25 is about the impediments in the reading speed due to the student's boredom in the reading exercises that continued with distance education. With the continuity of face to face education and learning all the sounds, the spelling phase can be completed, and further reading activities can be conducted. This shows that the reading activities performed in the face to face education process are more functional than those in distance education.

The Writing theme was divided into Writing in Distance Education and Writing in Face to Face Education sub-themes. The following examples are relevant to the Writing in Distance Education and Writing in Face to Face Education sub-themes:

“Although left-handers write slower, we were well prepared. I am currently monitoring. If one student can finish a text in the 3rd or 4th rank in a class of 20 people, which shows that s/he is progressing. More or less, we can notice it. As the teacher cannot supervise it, we observe it ourselves.” (P3)

The explanation parent P3 indicates that the student has made progress in writing during the distance education period. It can be asserted that the students who perform activities such as pencil grip, letter recognition, syllable formation in face to face education, and switch to distance education at the stage of initiating and progressing in literacy increase their speed in reading and writing in this process.

“Writing is one notch behind reading, it gets boring. S/he does not want to write. Especially, let's say, for example, s/he will write A for a whole page. S/he doesn't write it. We cannot make him/her. S/he only writes when it is mandatory, assigned by the teacher, or when it's puzzle style or activity-based or engaging. Moreover, s/he loves performing activities where there is less writing. But when there is a writing assignment that takes a long time, it gets boring. The kid doesn't want to do it.” (P26)

Parent P26 revealed that the students do the homework given by the teachers in face to face education although being bored at home. If writing activities are done in a fun way, they are more attractive to the student. It can be argued that students can achieve more efficiency because they are less bored through fewer writing tasks and more fun assignments.

The individual analyses of parent views on the first literacy and progression stage under Reading and Writing themes indicated no significant problems in students' progress in reading and writing through distance education. It can be thought that students were ready for sound and letter teaching, as they received face to face education during the preparation stage and switched to distance education at the starting and progress stages. It can also indicate that teachers did not delay their reading and writing activities during the distance education process.

The Experienced Problems theme was divided into Problems into Distance Education and Problems into Face to Face Education sub-themes. General Problems (f=37) and Problems Experienced in Literacy (f=17) categories were formed under the Problems Experienced in Distance Education sub-theme, while the Problems Experienced in Face to Face Education sub-theme was divided into General Problems (f=6) and Problems Experienced in Literacy (f=5). Relevant examples for Lack of Classroom Environment (f=14), Technological Problems (f=10), Student Boredom (f=8), Health Problems (f=4) Mental Fatigue (f=1) codes belonging to the General Problems (f=37) category related to the Problems Experienced in Distance Education sub-theme within the Problems Experienced theme are as follows:

“Although it is not like face to face education, because they did not see their environment with peers, and the teacher, they still learned the subjects well. But there were many shortcomings, namely the lack of friends and teachers.” (P16)
Parent P16 expressed the lack of school and class environment with their explanations in the example. Other parents whose opinions were taken also support their children to continue their education by recognizing the classroom environment through face to face education. It can be argued that the contact that the teacher establishes with students is one of the most critical factors affecting the education process.

"Since it was 1st grade, I was happy, even if it was two days of classroom training. Because my daughter was getting educated, when we go online, when she looks at the screen for 5 minutes, her eyes get tired, her back hurts, she can't get up and walk, and I wouldn't say I liked it. But if you say about her education, is it beneficial for her reading, it is seventy percent. Her reading improved a lot, but as I said, when she focuses for 10 minutes, she starts to turn left and right in the 11th minute, she is busy with her notebook, she is dealing with something because it is not the school environment, this is my teacher.” (P1)

The parent P1’s explanation supports the topics of boredom of the student and health problems. This view of the parents reveals both the advantages and disadvantages of distance education. Technological devices create health problems for a student in this age group and cause them to get bored. Moreover, teachers enable them to improve reading and writing because they do not break away from education even from a distance.

Examples regarding Distraction (f=2), Motivation (f=8), Student-Parent Conflict (f=4), Parent's Conceptual Errors (f =2), and Spelling Errors (f=1) categories in the Experienced Problems in Distance Education sub-theme within the Problems Experienced theme as follows.

“I saw a significant shortcoming, we couldn't do it. For example, the letter d is confused with b, there are conceptual structures that the child cannot figure, and for example, we had difficulties in correcting them. Because s/he needs an academic background to overcome this, unfortunately, we could not be very productive in terms of dictation and writing skills because it had to be done by an expert. These two issues were very challenging,” (P19)

Parent P19 stated that the parents were not as competent as the teacher in teaching literacy and had some conceptual misconceptions. It can be asserted that parent-teacher cooperation significantly affects the probability of mislearning for students.

The following example was relevant to the Hygiene Problem (f=6) in the General Problems category related to the Problems Experienced in Face to Face Education sub-theme under the Experienced Problems theme:

“For instance, I did a lot of things for my child for social distance, cleaning, hygiene and mask, and I warned him/her. The kid said directly, "my friends do not comply with the social distance when they go out." I'm sure s/he has never played outside. Not once. There was too much anxiety or something like that.” (P24)

Parent P24’s explanation shows that s/he is very careful about hygiene and that the student is also affected by this situation. It can be argued that the parents have hygiene concerns when they send their children to face to face education. An example on the Lack of Reinforcers (f=4) and Comparison with the Environment (f=1) within the category of Problems in Literacy, related to the sub-theme of Problems in Face to Face Education under the Experienced Problems theme is:

“How does the pandemic affect the child, how would his/her relationship with the teacher be? It's an era of masks, kids want to get a 'well done'. It is necessary to say 'high-five' or pat on the shoulder, at the very least, or if the child is doing it wrong, the teacher has to pick up that pencil and correct it, but these cannot occur very often. We cannot warn anyone. Maybe students receive everything from us, but do they achieve fully at school, from the teacher, and benefit the peer environment? I'm a little upset about these. Our child wants to be liked,
Parent P3 mentioned the lack of reinforcers experienced by his/her child during the distance education process. It can be noted that being approved by the teacher affects the success of the student positively. These approval and reinforcing situations occur naturally between the teacher and the student in the classroom environment, while it gets quite limited in distance education due to time constraints and technological problems. The Problems Experienced theme, in general, revealed two things. The parents stated that the students experienced problems due to the absence of the classroom environment, which is noted in the Problems in Distance Education sub-theme. Besides, they stated that they had problems with hygiene grouped under the Problems in Face to Face Education sub-theme. Table 6 demonstrates that the parents stated that they also benefited from distance education even though they favored face to face education. 1st grade students who started primary school in the 2020-2021 education term spent the first literacy preparation process at school in classrooms and completed the initial and progress stage with distance education. The parents who stated that this situation delayed the reading and writing activities found it accurate that the educational activities were performed remotely in terms of health conditions. Problems such as distraction, motivation problems, conflict with parents, lack of reinforcement from the teacher, classroom environment, and health problems affected the students and the parents during the distance education process. The parents who collaborated with the primary school teachers stated that the process turned into an advantage for the students regarding reading and writing skills.

RESULTS AND DISCUSSION

This study analyzed the teacher and parent opinions on the literacy process during the Covid-19 pandemic regarding the stages of preparation and initiation and progressing in the first literacy. It was observed that the teachers conducted activities to meet their students and inform the students about the process during the preparation phase. The teachers explained that they tried to determine students’ Developmental Traits at the beginning of the preparation phase and stated that they mostly performed motivation exercises for their affective characteristics.

Teachers expressed that they organized activities for listening, hand, arm, finger muscle exercises, drawing and lineation exercises, and motivation activities during the preparation stage. Tales, story reading, were utilized in listening exercises, dough playing in hand, arm, finger muscle studies, drawing, and line exercises in drawing studies.

The activities that teachers did for parents are awareness-raising and plan Preparatory Activities in the preparation phase. All the teachers raised parents’ awareness of the general process within the scope of the preparatory work for the parents. Moreover, it was concluded that the majority of the teachers tried to raise parents’ awareness of the literacy process and guided the students to the first literacy activities by helping the parents plan daily routines. Kluth (2020) stated that students could have discipline and balance in their daily lives both in studying and in the time allocated for games and exercises with a daily plan that parents prepare for them. The process might be even more straightforward if they also direct their parents and plan the day while teachers lead the process.

Teacher opinions regarding the first literacy and progression phase revealed that all teachers had reading, writing, and reading comprehension exercises in distance and face to face education. Teachers mostly used narration in distance education and return demonstration and question-answer in classroom teaching as methods and techniques. They also indicated that lectures and activities were only reflected on the computer screen as the root of narration dominance in distance education. Since this process was managed by a teacher-centered method due to the inactivity of the students, they most frequently used this method. It was revealed that the return demonstration method was used the most during classroom teaching. It was observed that teachers adopt the constructivist approach by including the student in the process while teaching letters, syllables, words, and other stages in
classroom teaching. It can be argued that literacy activities were more beneficial in classroom teaching.

The teachers' materials, tools, and equipment at the initial and progress stages show that the additional sources and educational sites were mostly preferred. It was found that all teachers benefited from different sources and various educational sites besides the textbooks. Türker and Dündar (2020) implied that the EBA platform, which teachers frequently use during distance education, was necessary and valuable. Moreover, they asserted that the development and improvement of this education platform against turbulences in the future would provide an advantage to the education stakeholders. Kasa Ayten (2021) also stated that teachers used educational sites extensively and included educational sites such as EBA and Okulistik in their lessons. Moreover, it was observed that teachers use technology especially in Turkish lessons and the literacy process. Bakioğlu and Çevik (2020) concluded that teachers developed a positive attitude toward using technology in their educational activities during the Covid-19 pandemic. It can be noted that this supports the view that in the first literacy process, primary school teachers shall use technological tools and content to advance the process comfortably in both distance and classroom teaching. Moreover, teachers' effective use of technological content effectively, students also improve in this regard. Aldemir and Aşvar (2020) found similar results. They discovered that individuals started to use digital tools, especially social media, while working from home, attending meetings remotely during the Covid-19 pandemic, as the students were attending classes through distance education, following the news, or just spending time.

The problems experienced by primary school teachers during the first literacy start and progress stages vary in classroom and distance education. The general problems experienced in distance education were the boring out of the students and the technological deficiencies, the family intervention in the reading exercises, and the writing issues. Akgül and Oran (2020) stated that the students were bored, could not focus on the lesson, were delayed in learning, acted reluctantly, did not care, and had problems with the course material supply in the educational activities during the distance education process. Since the students were away from the classrooms, they stated that they had motivation problems for education. The teachers' opinions regarding the categories boredom of students and technological deficiency under the general problems support this view. Bayburçu (2020) reached similar results and stated that Turkish teachers had problems with students due to technological equipment and connection deficiencies. Moreover, Erbaş (2021), Fidan (2020) and Sağır İn (2021) highlighted technological problems and the inadequacy of infrastructure and equipment.

It was found that this problem is the most common since the teachers could not intervene with the students during distance education regarding the writing problems, and the parents could not provide adequate writing instructions. Ekici Calın (2019) concluded that the parents' knowledge of the sound-based sentence method is not at the desired level for the first literacy teaching. Besides, they should be informed about the sound-based sentence method to overcome this problem. Considering the problems experienced, technological inadequacies and the family interventions in reading exercises stand out. Teachers stated that some families did not regularly attend distance education due to the lack of internet and technological tools. Yurtbakan and Akyıldız (2020) found that students could not attend the classes due to the high cost of the internet, the lack of inadequacy, and this hindered students' access to the assignments given by the teachers. Moreover, it was observed that the letters, syllables, words, or sentences that the students could not read were whispered to the student by the parents during the reading activities, and the student told this to their teachers. It can be argued that this problem prolongs the transition period of the student to reading and writing. Another problem with parents was that they caused mislearning in the first literacy teaching. It was found that the parents gave the pronunciation of sounds to be taught inaccurately, causing permanent learning errors for the students. This shows that parents had difficulties in providing the necessary support to the student. Uğur Göçmez and Ünal (2021) also stated in their study that parents negatively affect the first literacy process. Bayat (2014) highlighted that the parent with difficulties providing sufficient support to their students caused various negativities in the first literacy teaching process. Informing the parents about the first literacy teaching and curriculum was propounded as a solution.
It was discovered that the first problem encountered in classroom teaching was about letters and syllables. It was revealed that especially the students without pre-school education had problems with pencil grip, writing letters, and how the sounds come out of the mouth due to masks. Besides, several teachers have also stated that there were problems with students' adaptation to school.

Teachers' solutions for these problems indicate that they used rewards and reinforcement to solve the general problems and that parent cooperation was a solution to the literacy problems. Sağırlı (2021) concluded similarly that the parents made a significant contribution to the process in the first literacy teaching conducted with distance education, and the support they showed during this period flourished teachers' work. Kirmızıgül (2020) argued that parents were also substantially affected by the digitalization of the process after the decisions were taken regarding education with the Covid-19 pandemic. The families who have experienced distance education have also indirectly participated and contributed to the education process. Akyol (2019) also stated that the teachers' biggest assistants in literacy and language development were families. The importance of the family factor has become even more vital than before during the Covid-19 pandemic, and parent cooperation has become integral. Moreover, parents provided feedback with videos and photographs so that the teachers could follow the process. Teachers found solutions such as applauding students, playing games, drawing pictures, painting, and gifting storybooks as rewards and reinforcements.

Teacher opinions revealed that classroom teaching is more beneficial than distance education. It was highlighted that it is more appropriate to contact the student and provide direct information transfer so that the first literacy process can progress more appropriately. It was stated that mislearning could be prevented faster during classroom teaching, and proper teaching can be provided without parent intervention. Moreover, it was noted that while student-centered methods were preferred in classroom teaching for literacy activities while the narration method was more common in the distance education process. It was also found that the methods and techniques used vary in classroom teaching. Similarly, Ergüç Şahan and Parlar (2021) asserted that primary school teachers had more difficulty in the distance education process than face to face education, and it is a process that requires more planning. Besides, there is more in-class interaction during classroom teaching, but the narration is more common in distance education, especially at the initial phase.

Findings regarding the parent opinions on the preparation stage in the first literacy process were grouped under two themes: preparatory activities for distance and classroom teaching. It was observed that parents mostly used additional sourcebooks as materials and tools for students during the planning phase of the preparation process for distance education. They benefited from various educational sites, videos, and visuals besides the textbooks. The teacher and parent opinions support each other in this regard. The opinions hint at the finding that both sides benefited from additional sourcebooks, educational sites, various videos, and visuals in the first literacy process. According to the parent opinions regarding readiness within the Developmental Traits sub-theme of the preparation process for distance education, approximately half of the students received pre-school education, and they had knowledge of letters and numbers. It was also revealed that the hand, arm, and finger muscles were more developed in these students. It can be concluded that students with pre-school education were more prepared for the first literacy process. It was observed that the parents made the students more conscious about hygiene, masks, and distance precautions in the first literacy preparation process for classroom teaching when they sent their children to the school. Willis (2020) stated that behavior, self-control skills, and social skills related to hygiene should be taught by parents. Yılmaz et al. (2020) and Ergüç Şahan and Parlar (2021) also revealed that parents had health concerns. It can be understood that parents were worried about the adverse effects of the Covid-19 pandemic rather than the literacy teaching in the face to face education.

The parents' views on the first literacy teaching preparation stage were examined under two groups as distance education and face to face education. It was revealed that awareness-raising studies were conducted in face to face education while planning and monitoring the developmental features are in question in distance education. It was observed that the parents mostly benefited from sourcebooks and educational sites as materials and tools in distance education. Moreover, parents
stated that they needed the technological tools most and felt the absence of the classroom environment while eliminating deficiencies for the students. It was observed that almost half of the students received pre-school education, and one-third of them knew letters and numbers. It was revealed that some of the remaining students did not progress much within their parents' decisions to have this information in primary school. It was observed that most parents felt uncomfortable about hygiene while sending their children to school as they raised awareness about social distance and mask usage for the preparatory work for classroom teaching. Still, they thought that distance education would be better hygiene.

The parent opinions regarding the first literacy start and progression stages, the themes of reading, writing, and experienced problems were analyzed through two sub-themes: distance and classroom teaching. Parents stated that their children's progress in reading was faster in the distance education process for the reading theme. They stated that the same was true for the writing theme. It was observed that both skills improved in the distance education process. It can be asserted that students who started their education in classrooms at the beginning of the 2020-2021 academic year and switched to distance education in November could read certain syllables and words because they had learned only the sounds in the first group during this period. They learned the sounds in other groups and advanced in reading and writing during the distance education process.

The problems experienced by the parents show that the problems arising from the lack of a classroom environment were the most common in distance education. The fact that the students could not meet the conditions in the classroom at home caused problems in this process. Moreover, parents also stated that they frequently experienced problems such as technological deficiencies and student boredom. The parents stated that the students mostly encountered motivation problems the problems experienced in literacy in the distance education process. Çaykus and Mutlu Çaykus (2020) emphasized that psychological support should be available to students and the group whose psychological resilience should be increased by providing psychological support during the Covid-19 pandemic process was primary school students. It can be argued that this situation was rooted in the lack of classroom environment, the distance of the teacher, and the fear created by the pandemic. The general problems experienced in face to face education, the hygiene problem were reencountered, and the lack of reinforcement for literacy.

It was revealed that the interviewed teachers had great difficulties in the distance education process and could not actively involve the students in the process as they did in face to face education. They stated that both students and the parents experienced adaptation problems during the pandemic. Yurtbakan and Akyıldız (2020) stated that primary school students preferred face to face education instead of distance format to have more efficient education and training activities. The parents found it suitable for their children to stay home and continue their literacy activities with distance education during the Covid-19 pandemic. It was concluded that they supported face to face education and found it more beneficial when the pandemic is overcome. Akgül and Oran (2020) reached similar results and revealed that the advantages of distance education are that students do not fall behind in education, educational activities are maintained, parents are closely interested in the lessons and student development, and students are protected from pandemics and other diseases because they do not go to crowded spaces such as schools.

RECOMMENDATIONS

The following recommendations can be propounded for literacy during the Covid-19 pandemic:

- Technological support should be provided to teachers, students, and parents with technological issues due to the suspension of schools due to the Covid-19 pandemic. Students' internet connection and technological device needs can be met at a minimum level to prevent delays and disruptions in the first literacy process and to progress more
systematically and healthily with distance education. Thus, the problems of families and teachers can be reduced to a manageable level.

- The methods used by teachers in the literacy process in distance education remained in a teacher-centered approach. In-service training on technological pedagogical content knowledge may significantly improve the literacy process for teachers.
- Educational platforms with enriched content can be initiated considering the importance of first literacy teaching and the material and content-based deficiencies experienced by primary school teachers in the distance education process.
- All stakeholders can be provided with psychological support and guidance activities for teacher-student-parent cooperation and the problems experienced during the epidemic period.
- Students who started their first literacy education with distance education during the epidemic period could not participate as actively as in the classroom teaching and completed the literacy transition process later. Recovery lessons can be organized for these students.
- The teacher and parent opinions on the literacy process during the Covid-19 pandemic were examined in this attempt. The impact of the pandemic on the education system and all stakeholders can be examined with alternative data collection methods.

**REFERENCE**


MNE (2019). *Türkçe dersi öğretim programı (ilkokul ve ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. sınıflar).* Ministry of National Education.


Willis, A. (2020). *Students won’t get through all school content while learning at home: here are 3 things to prioritise.* https://theconversation.com/students-wont-get-through-allschool-content-while-learning-at-home-here-are-3-things-to-prioritise-134539


Towards a Re-conceptualisation of the Role of Teacher Educators in a Changing World: A Critical Pedagogy Perspective*

Sibel Akin-Sabuncu ¹
TED University & Teachers College, Columbia University

Abstract

This qualitative study examines teacher educators’ articulations about their beliefs and motivations for preparing the next generation of teachers. The study also explores how teacher educators conceptualise their roles as the teachers of prospective teachers. Employing case study design, the participants included 10 teacher educators who serve at a highly selective, public, research university in Turkey. The data were collected through semi-structured and in-depth individual interviews. Adopting critical pedagogy as the theoretical framework, the interviews were analyzed by content analysis method with the help of NVivo 10 qualitative data analysis software. The results showed that the teacher educators specifically saw their roles as enacting change, advocating for democracy, equity, and social justice, and promoting the improvement and welfare of societies, in an effort to bring more emancipatory educational practices in the society through pre-service teacher education. This study furthers our understanding of how teacher education programs could improve their professional preparation and practices to push the agenda for social justice and equity in K-12 schools.

Keywords: Critical Pedagogy, Pre-Service Teacher Education, Teacher Educators.

DOI: 10.29329/ijpe.2022.426.20

* This study was presented at the annual meeting of American Educational Research Association (AERA) in New York/USA between April 13-17, 2018.

¹ Sibel Akin-Sabuncu, Assist. Prof. Dr., Faculty of Education, Ted University, ORCID: 0000-0002-4081-1233

Email: sa3169@tc.columbia.edu
INTRODUCTION

The number of poor children, children of immigrants, and children with disabilities as “minority groups” has been increasing dramatically both at the national and international levels. Although these changes represent a shift in student demographics in the educational system, the present educational systems are failing to respond to the needs of minoritized children who are not part of the mainstream (Apple, 2004; Cochran-Smith et al., 1999; Darder, Baltodano, & Torres, 2003; Han, Madhuri, & Scull, 2015). In spite of the tremendous changes evident in societies that have experienced an increase in cultural and linguistic diversity, schools and faculties of education are still functioning as if teachers were prepared for the classrooms of half a century ago (Nieto, 2000). Hence, this has led to many calls and serious implications for the reform of K-12 schooling and of teacher education, since we need teachers willing to advocate for social change and social justice. In response to these calls, in many countries teacher education has become the focus of intense debate over how to prepare sufficient and highly qualified teachers (Cochran-Smith, Grudnoff, Orland-Barak, & Smith, 2020; Swennen & Van der Klink, 2009), who are not only capable of educating students but also work for social justice and understand that the structural inequities operating within schooling perpetuate inequality of educational opportunities for different segments of the school population (Cochran-Smith et al., 1999). However, this is hardly accomplished without examining the assumptions, values, and beliefs of teacher educators — those who teach the teachers — and how this posture informs, consciously or unconsciously, their perceptions and actions (Bartolomé, 2004) in preparing prospective teachers. Although teacher educators are usually held responsible for teacher quality and blamed when students fail to meet expectations in schools, traditionally scarce attention has been paid to teacher educators who are to meet the complex demands of educating teachers for the 21st century (Cochran-Smith et al., 2020). Given that education is unavoidably an intentional (Ben-Peretz, 2001) and political (Cochran-Smith, 2000) enterprise, with teachers having ideas and the power to shape it, critical questions have, therefore, arisen particularly for teacher educators to reconsider the aims of education in our changing world (Ben-Peretz, 2001). Such questions include how to design teacher education programs, and most critically, infuse social justice into pre-service teacher education and prepare teachers who are seeking to advance educational equity for all children and work toward a more just society (Cochran-Smith, 2010).

Indeed, both nationally in Turkey and internationally, teacher education has long been criticized as incapable of preparing highly-qualified teachers (Cochran-Smith, 2004; Yildirim, 2011). Nonetheless, this responsibility continues to rest primarily with teacher education programs, wherein teacher educators are important players who spearhead educational reforms and are responsible for preparing competent teachers (Cochran-Smith, 2003, 2010). Teacher educators not only provide guidance to student teachers and support their learning, but they also play a significant role in teaching prospective teachers how to teach and in promoting good models and certain views of learning (Swennen, Lunenberg, & Korthagen, 2008). Given that “teachers teach as they are taught,” if we are to have teachers who work for social change, we must obviously also have teacher educators who explore and reconsider their own assumptions and beliefs (Lunenberg, Korthagen, & Swennen, 2007) about social change. Embedded in this perspective, what teachers attain from preparation depends in part on the beliefs and perspectives that their teacher educators bring with themselves to teacher education since the practices of teacher educators are an embodiment of their own educational beliefs and intentions. Those beliefs, shaped by the cumulative experience of teacher educators’ implicit personal and educational biographies (Weinstein, 1990), hold implicit assumptions about people, classrooms, learning, the academic material to be taught, and events (Kagan, 1992). Therefore, they function as a filter for decision-making processes and determine how the teacher education program is viewed (Villegas, 2007). They drive classroom actions (Richardson, 1996) and are therefore integral components and powerful mediators of teaching practice which shape processes in teacher education programs (Kagan, 1992; Pajares, 1992; Richardson, 1996), as well as students’ learning opportunities and experiences (Cochran-Smith, 2010). Thus, how teacher educators perceive their role may influence and shape their teaching practices, which may impact prospective teachers’ development, shape their experience of learning to teach, and change their own conceptions and teaching practices (Tatto, 1998).
Scholars and researchers have studied much about teachers and their observable effects on students; however, missing from teacher education policy conversations, research on teacher education has largely overlooked teacher educators with regards to who they are, what they believe, and what they do (Berry, 2007; Ducharme & Ducharme, 1996; Goodwin et al., 2014; Grierson, 2010; Koster, Brekelmans, Korthagen, & Wubbels, 2005; Loughran, 2014; Lunenberg et al., 2007; Murray & Male, 2005; Smith, 2003; Swennen & Bates, 2010; Swennen, Jones, & Volman, 2010). Accordingly, Cochran-Smith (2003) notes that not only has much less attention been devoted to teacher educators, but even when they are at the heart of discussion, the focus tends to be more on demographics and general trends, such as what their backgrounds are and what they teach.

Within the landscape of teacher education research in Turkey, Hazır-Bıkmaz and Aslan (2019) similarly report that critical issues such as the competencies that teacher educators need to possess, their preparation, professional identity, and professional development have received scant attention. At the same time, the number of faculties of education peaked in 2019 at 93, and there are around 10,000 teacher educators working at those faculties (Hazır-Bıkmaz & Aslan, 2019). Despite this, there have been only a few studies focusing on teacher educators, including the investigation of their professional development (e.g., Gökmenoğlu, Beyazova, & Kılıçoğlu, 2015), characteristics (e.g., Erginer, Erginer, & Bedir, 2009; Fidan, Duban, Yüksel, Kasapoğlu, & Yamaç, 2013; Korkmaz, 2013), and the qualities that are expected from them based on the perspectives of pre-service teacher candidates (Bahar-Güner, Tunca, Alkın-Şahin, & Oğuz, 2015; Celik, 2011; Tunca, Şahin, Oğuz, & Güner, 2015). However, the neglect of how teacher educators view their roles and responsibilities for high-quality teacher preparation may legitimise, and even undermine, certain views about the purposes of schooling in a democratic society and the role of the teachers in educational policy and reform (Cochran-Smith, 2004; Cochran-Smith et al., 2009). Moreover, given that quality teacher education depends on quality teacher educators (Goodwin et al., 2014), no structural or curriculum change can make a significant difference if teacher educators, who translate and enact the material, are not committed to social change rooted in equity and social justice. It is, therefore, vital to examine teacher educators’ beliefs and motivations regarding their roles and responsibilities for preparing the next generation of teachers, which can offer critical insights into improving the professional preparation and teaching practices of teacher candidates (Villegas, 2007), who are committed to teaching for social justice, equity, and democracy, as teacher educators view and shape the teacher education programs through the beliefs that they have (Weinstein, 1990).

**Theoretical Framework**

The theoretical underpinnings of this study lie in critical pedagogy to analyse teacher educators’ beliefs on their intentions and commitments to empowering education and preparing student teachers for the goal of teaching for social justice (Shor, 1992). In adopting this framework, critical pedagogy is defined by drawing on the work of Freire and Giroux in recognizing that education is one place where the individual and the society are constructed. According to this framework, education is a transformative, reflexive, and liberatory action that involves inquiry towards developing a more socially just world, and it promotes the process of raising critical consciousness (Darder et al., 2003; Freire, 1998; Shor, 1993; Shor & Freire, 1987). This theoretical framework is grounded in the beliefs that education promotes an emancipatory culture of schooling that seeks to transform classroom structures and practices that perpetuate oppressive, unjust, and undemocratic life (Darder et al., 2003). It views education as a process that helps to fight against reproducing the status quo and advocates for denouncing existing inequities and discriminatory school and social conditions, constraints, barriers, and practices that diverse others face (Bartolomé, 2004; Han et al., 2015). Accordingly, education ultimately aims to liberate the oppressed in schools and society (Darder et al., 2003; Kincheloe 2009; McLaren 2009). To this end, combined with praxis - the ongoing relationship between theory and practice as a core principle of critical pedagogy - its aim is that future teachers will learn to see students fully and fairly; see themselves as active agents of change in schooling; remain mindful of the political, cultural, social agendas they bring to teaching with them; and find practical application in classrooms to become courageous in their commitment to defend social justice for all students (Ayers, Michie, & Rome, 2004). It is also indispensable that teachers strive, beyond technical
skills, to challenge traditional structures of power and control in the classroom in order to create humanizing, culturally responsive, inclusive, socially sensitive, democratic, and self-empowering educational contexts (Kincheloe, 2012). Such contexts will allow teachers to encourage students to become critical thinkers who can act upon the world (Bartolomé, 2004) and develop autonomous habits of mind rather than passive habits of following authority (Shor, 1992).

Given that education is by nature social, historical, political, and cultural (Giroux, 1981), it is therefore a value-laden social practice (Liston & Zeichner, 1987). As such, there is no unchanging role for teachers (Shor, 1987). From this pedagogical stance, teachers at all levels of schooling are potentially powerful agents of social change (Giroux, 1997). In particular, teacher educators have a chief role for teacher education in efforts to bring about more emancipatory, critical, and productive educational practices in schools, in that they are to educate, not inculcate, prospective teachers as reflective practitioners equipped with reflective inquiry and analytical thought (Liston & Zeichner, 1987; Milner, 2003). In accordance with these notions, critical pedagogy serves as a starting point in this study for asking questions that will help teacher educators to explore their beliefs and evaluate critically their practices to empower themselves for social change (Shor, 1993). According to critical pedagogues, one needs to analyse their own ideologies as critical educators to strengthen a critical classroom practice (Graziano, 2008) Thus, through the lens of critical pedagogy, this study addresses how teacher educators articulate and reflect on their beliefs and motivations for preparing the next generation of teachers. To this end, the study seeks to answer the following research question:

What beliefs and motivations do teacher educators hold for preparing the next generation of teachers?

**METHODOLOGY**

**Design**

Drawing on the methods and the principles of qualitative research paradigm, this study employed a case study design, which is an empirical inquiry that involves an in-depth examination of a particular “case” within its real-life context and draws on the prior development of theoretical propositions that guide the data analysis (Yin, 2014). Accordingly, the present study utilized a single case study design and took place within the context of a highly selective, public research university (Heritage University, a pseudonym, the case) located in the capital city of Turkey, whose overarching mission is described as dedicated to improving the quality of people’s everyday lives both at the national and universal level, with strong aspirations to empower democracy, advance research, community service and collaboration, and develop policy and practice about teaching, learning, and human development across the lifespan.

**Context and the Case**

As inevitable determinants of educational change, the effects of globalisation and neoliberal economic policies all over the world, including in Turkey, have been manifested through a number of mechanisms, such as structural reforms, curriculum, and administration. Among these mechanisms, changes in the structure and content of teacher education have been a central element (Guven, 2008). While several models of teacher education have been implemented in the history of teacher preparation in Turkey, the major change took place in 1981 when a “unified” system of higher education was introduced and the responsibilities of teacher preparation were transferred from the Ministry of National Education (MoNE) to the Council of Higher Education (CHE). This being the case, teacher education is bound within the institutional mandates of higher education, is subjected to bureaucratic tendencies, and is governed by national standards regarding teacher certification. Although several other reasons
account for the narrow scope of teacher education research, policy, and practices in Turkey, it is, therefore, noteworthy that there is a top-down approach to the teacher education curriculum, as teacher education programs have been more or less prescribed by the CHE since 1998 (Yıldırım, 2013). Within this structure, the increasing rigidity and greater control of teacher education reforms are less a response to global economic changes and more a part of new policies that have been moving from evolutionary to technocratic modernization (Guven, 2008). This shift may imply that implementing a teacher education system that challenges social, political, and economic structures is particularly compelling given the internal structure and policies surrounding teacher education.

Specifically, teacher education programs in Turkey are frequently under severe attack by the structural and curricular changes mandated by national authorities. These mandates relate to a range of issues including admissions, knowledge base, duration of teacher education, certification, alternative teacher education, the high number of faculties of education, standards, and quality and quantity concerns (Atanur-Baskan & Karasel-Ayda, 2018; Azar, 2011; Bilir, 2011; Kızılçağloğlu, 2006; Ulubey & Başaran, 2019; Üstüner, 2004; Yıldırım, 2011). These issues in teacher education programs have been rooted in the longstanding competing agendas over teacher education (Yıldırım, 2011). Paradoxically, however, teacher education programs are required to substantiate their efforts to improve K-12 students’ academic achievement, which is increasingly considered as the sole measure of learning as a result of an immense standardised testing culture underpinned by a ‘one-size fits all’ standard approach to schooling (Leistyna, Lavandez, & Nelson, 2004; McDonald & Zeichner, 2009). Moreover, the relationship between theory and practice is unfortunately far too often neglected or dismissed in teacher education programs. In such a disheartening climate, teacher educators have been compelled to emphasize the narrower, more technical aspects of teacher education rather than other aspects which are more congruent with a social justice perspective that would take account of broader educational aims and purposes (McDonald & Zeichner, 2009) and appreciate the complexity and uncertainty of a teaching-learning relationship (Weinstein, 1990). Consequently, prospective and in-service teachers are criticised for being deskilled technicians who are uncritical consumers of existing knowledge, instead of active subjects engaged in inquiry (Altan, 1998; Guven, 2008; Leistyna et al., 2004). Similarly, one of the most detrimental results of this perspective on teacher education is that teacher educators no longer possess a good deal of the social, historical, cultural, philosophical, and ideological perspectives that are fundamental to the field (Guven, 2008).

Within this larger context, the Heritage University has a unique place considering the critical role it has played in the ongoing process of democratization in Turkey since its foundation. In addition, the university is unique among public universities in that it has a relatively global faculty profile; utilizes English as the medium of instruction; recruits highly qualified academic staff; preserves a reputation of excellence in scientific, economic, and social achievements; and is a leading and respectable higher education institution (Caliskan, Akin, & Engin-Demir, 2020). The Heritage University also has a climate that embraces its campus as a cultural heritage, which enables the creation of a common, institutionalized, and shared culture among its members alongside its deep-rooted socio-political history. That is, since the flowering of political activism in the 1960s across the world, the Heritage University has remained one of the centers of student protests and a longstanding site of active citizenship and resistance movements in Turkey.
Participants

Employing criterion sampling (Patton, 1990), the participants included 10 teacher educators, who offered a set of core pedagogical courses that are mandatory in the curricula of all teacher education programs (e.g., Introduction to Education, Educational Psychology, Classroom Management, and Guidance). Thus, utilizing criterion sampling, the study ensured the selection of the participants who were likely to be information-rich based on their contribution to the professional development of preservice teachers in different teacher education programs, rather than a particular teacher education program. The average age of the participants was 46, ranging from 37 to 52. Their experiences as teacher educators ranged from 3 to 27 years. While all of the teacher educators were in tenure-track appointments, their academic titles ranged from Assistant Professor to Professor.

Data Collection and Analysis

After receiving ethical approval from the institutional ethics committee, the data were collected through semi-structured, in-depth, and face-to-face individual interviews (Marshall & Rossman, 2011) as interviews seek to gain insight into the participants’ world by eliciting rich information about their beliefs, opinions, and experiences from their own frame of reference (Bogdan & Biklen, 2007; Creswell, 2013; Patton, 1990). The interview schedule was developed by the researcher and consisted of both demographical and open-ended questions, which were revised and piloted after taking the opinions of two experts in the field, who had experience in conducting qualitative research in teacher education. The demographical questions included participants’ gender, age, educational background, experience as a teacher (if any), experience as a teacher educator in general and in the Heritage University specifically, academic title, and the courses they offered in teacher education programs. In addition to the demographical questions, the interview schedule consisted of seven open-ended questions that are also supported with probes and prompts (e.g., What are some understandings, principles, or goals you have for your student teachers? How do you define effective teacher educator? What fundamental knowledge, skills, and attitudes must a teacher educator have in order to prepare teachers who can respond effectively to the needs of all students?). Informed consent was obtained from the participants prior to the study. Each interview lasted 30 to 40 minutes and was audio-recorded with the permission of the participants. The interviews were conducted in Turkish.

The data were analysed by content analysis method. Accordingly, the process of analysis included inductive coding, which enabled a recursive and reflexive process (Bogdan & Biklen, 2007) to identify, code, and categorise the essential patterns (Patton, 1990). The data analysis was performed with the help of NVivo 10 qualitative data analysis software. The interviews were transcribed verbatim, and the data were first broken into manageable units or codes. Then, the researcher searched for recurrences, patterns, and regularities among those codes to derive broader themes or categories that reflected the overarching research question (Bogdan & Biklen, 2007; Creswell, 2013; Miles & Huberman, 1994). After a set of transcripts were coded by the researcher, an initial code list was created and then revised based on the discussions with two experts who coded the same set of transcripts and helped ensure the consistency of the codes and categories developed by the researcher (Marshall & Rossman, 2011; Miles & Huberman, 1994; Patton, 1990). To present the findings in participants’ own words, sample quotations were identified and translated to English by the researcher. To ensure the accuracy of translations and properly convey meaning from one language to another, the selected quotations and their translations were checked by an expert in the field.
of English Language Teaching. Pseudonyms were used to afford anonymity to the participants in reporting the findings.

**Trustworthiness**

The trustworthiness of this qualitative research was ensured by utilizing different strategies. First, the strategies for assuring credibility included taking the opinions of three experts on the interview questions, piloting the interview schedule with two teacher educators prior to the data collection with the main participants, following in-depth data collection procedures, establishing intercoder reliability, and ensuring referential adequacy. Second, transferability was provided by employing purposive sampling strategy and providing a thick description of the entire research process. Lastly, to ensure dependability and confirmability, the study benefited from an audit trail, in which the researcher engaged in conversations with an external researcher, who had expertise in qualitative research, to monitor all the steps taken throughout the study (Lincoln & Guba, 1985; Marshall & Rossman, 2011).

**FINDINGS**

The results demonstrated that teacher educators’ reflections on their motivations for preparing prospective teachers are grounded in 1) enacting change; 2) advocating for democracy; equity, and social justice; and 3) promoting the improvement and welfare of societies:

**Enacting Change**

Most participants explained that teacher educators play a substantial role in enacting change in societies, especially by preparing teachers who can challenge stereotypes and social constructions. To illustrate, Ayşe (pseudonym), articulated:

“Prejudice in K-12 schools takes many silent forms. Lowered expectations and ‘one size-fits-all’ thinking have as equally dramatic effects on the students as any open display of prejudice. The former is even harder to detect. I aim to help pre-service teachers make realisations and connections, as well as engage in a reflective practice for their actions, which, I believe, can lead to social change.”

In enacting change, many participants also made connections to fighting oppression, whereby they explained that they viewed teacher educators as activists. For example, Selma (pseudonym) pointed out:

“I work to provide teacher candidates with the tools to shape themselves, which can ultimately contribute to social change. I want them to break down barriers in their classrooms and forge connections between their students, inspiring them to be active and engaged citizens. Finally, I strive to support them to create a school environment that all students feel empowers them. Teacher educators can create inclusive learning environments for inquiry and dialogue through creative, flexible, and thoughtful pedagogy and curriculum that transcends limitations to learning, including exclusionary, non-unifying classroom practices and systemic forms of oppression.”

Moreover, especially by discussing the pervasive testing culture on a larger scale in Turkey, almost all participants addressed the importance of recognizing teacher candidates’ individual differences. Accordingly, Veli (pseudonym) suggested that teacher educators should build upon the funds of knowledge that they bring to initial teacher preparation:
“...Testing’s core problem is that its method of learning is only geared toward one type of student. As a teacher educator, it is important to recognize that every student teacher learns in different ways and the main role a teacher educator has is to allow everyone an access point into the material by drawing on what students bring to their learning process, by which s/he can start enacting change in the classroom environment.”

However, all teacher educators criticized the mandatory teacher education curriculum. They noted that their motivation to embrace teacher candidates’ lived experiences, identities, and realities was hindered by a curriculum that leaves little room for creating curricular openings to draw on students’ knowledge. National teacher education policies and systemic structures emerged as limitations that were beyond the individual responsibilities of teacher educators. Nonetheless, the participants expressed high motivation to confront such obstacles even though they did not consider this as an easy task. Accordingly, Veli, like some other participants, further pointed to the importance of acting as a mentor who models educational goals, integrates various activities into teacher education as a way of organizing extra-curricular activities, and offers additional learning opportunities to the teacher candidates in enacting change through teacher education:

“...I believe every student can find success through the educational environments that suit them best as individuals, and it is my role as an educator to transform the existing prescribed educational settings and help teacher candidates find their individualised way. Yet, in so doing, these teacher candidates do not need one more authoritative voice dictating right from wrong, they need a compassionate mentor, who would walk the journey towards academic achievement with them. In becoming that person, my work traverses across music, film, theater, poetry, and visual art to narrate the inner and outer lives of student teachers.”

Lastly, some participants underscored the role of collaboration with community members and colleagues and the importance of integrating additional critical course readings into the given curriculum and the prescribed course descriptions mandated by the CHE.

**Advocating for Democracy, Equity, and Social Justice**

Teacher educators not only connected their role of educating future teachers to enacting change, but also aimed to raise teacher activists who will advocate for democracy, equity, and social justice. Specifically, most participants mentioned their responsibility to raise prospective teachers who will work to narrow the achievement gap that grows increasingly wide due to factors such as socioeconomic status and other sources of inequity in schools that continue to have growing numbers of diverse students with cultural, linguistic, and immigrant backgrounds. For instance, Selma (pseudonym) addressed her commitment to recognizing and ending inequalities in the pursuit of social justice and providing access to quality education for all students:

“...Education, if perhaps not the sole cause of the opportunity gap is certainly a key player; as a teacher educator, my goal is to prepare teachers who work for eliminating our schools’ role in perpetuating it. I believe that there is no better tool to empower students than a teacher’s faith or knowledge that we pay forward. As teacher educators, we should bridge the gaps by equipping future teachers with the knowledge, skills, and mindsets to fight against the inequalities in students’ educational opportunities and provide quality education to all students.
In discussing how to fight against the systems of social injustice and inequality of educational opportunities that affect students, parents, and schools, Sevgi (pseudonym) echoed:

“I am dedicated to delivering the message to my students that education is a fundamental human right and every child deserves a high quality education. My goal is to raise critical consciousness and develop critical thinking skills of teacher candidates and help them prove that the students in their classroom, who are minorities, disabled, or come from low-income and/or rural communities, will make dramatic gains and outperform their peers who are of higher socio-economic status.”

In stating their perception that the teacher educator’s role includes promoting social justice, some teacher educators articulated that they expected teacher education system to provide them with the tools, autonomy, flexibility, and support necessary to encourage prospective teachers to critically examine their world. In relation to this, they further highlighted the critical role of teacher educators to empower future teachers with the ability to examine the issues of authority and power to enact democracy, equity, and social justice in educational settings. Therein, Hatice (pseudonym), like most participants, asserted, “I see the prospective teachers as the Heritage University graduates, in a profession to be intentionally cultivated, from a school of education that engages the injustice it seeks to resist.” Hence, the participants specifically underlined the context of Heritage University and connected its climate to their role in advocating for democracy, equity, and social justice.

**Promoting the Improvement and Welfare of Societies**

Most teacher educators stated that they play a crucial role in promoting the improvement and welfare of society. Specifically, the participants expressed a strong link between their role in conducting high-quality research that would make an impact on educational policy and practice, and its contribution to the improvement of the society in which they live. Similarly, in a bi-directional focus, all participants stated that practice-led research was as important as research-led practice in terms of contributing to a body of knowledge and, thereby, revolutionizing academic research. Implicit in these perceptions was the teacher educators’ motivation to be part of a larger partnership that would strengthen ties between faculty, school, and the community. Moreover, by envisioning their role as one that supports contextualised, dynamic relationships with schools and society, some participants, like Fatma (pseudonym), alluded to a commitment to recognizing and rebuilding the schools’ communities by serving as a role model and mentor for future teachers:

“Teacher candidates need role models and mentors inside and outside of class who demonstrate the importance of education in shaping one’s future. As a teacher educator, it is my responsibility to engage them in the discussions of how education can be used as a tool particularly to improve the welfare of the society. To this end, I aim to support partnerships between schools, districts, and universities through my research projects and the courses that I offer to support high quality teacher preparation.”

A large number of participants also pointed to the importance of engaging in reflective practice, building collegiality, and strengthening community partnership in order to develop inclusive curricular practices and pedagogy. For example, Kemal (pseudonym) stated:
“...Through community work, collegiality, and inclusive classroom practices, teacher educators can transcend limits and move toward more democratic and meaningful engagement with the prospective teachers who will, in turn, aim to strengthen their own students’ community membership and create opportunities for their academic and social achievement with transformative outcomes.”

Thus, the participants believed that such participatory pedagogies and practices in democratic learning environments would allow teacher candidates to create opportunities for community members facing a range of political, social, and economic realities, and this would help them stay connected with the community.

DISCUSSION AND CONCLUSION

Over the past decades, there has been intense national and global attention to teacher quality, specifically in terms of the knowledge, skills, and dispositions that teachers should have. Regarding this debate, a controversial aspect of teacher education has been whether and how teacher education programs should emphasize social justice as part of the curriculum (Cochran-Smith et al., 2009). That is, considering the fact that the task of successfully preparing teachers to work with an ever-growing culturally and linguistically diverse student body poses an increasing challenge for teacher educators, it is important to expose prospective teachers to the best practical strategies to provide for effective teaching for all students. However, this task is unlikely to be accomplished without examining teacher educators’ beliefs and intentions, since those beliefs shape and inform teacher educators’ perceptions and actions in pre-service teacher education programs (Bartolomé, 2004). In contributing to this conversation, this study explored how teacher educators, as the teachers of prospective teachers, articulated and reflected the beliefs and motivations they hold for preparing the next generation of teachers. To this end, the study employed the tenets of critical pedagogy to analyse the beliefs and intentions of teacher educators within the context of a public university in Turkey. The selected university, Heritage University, has played a unique role in the enduring process of democratisation in Turkey and preserved its reputation for being a continuing site of active citizenship and resistance movements. By situating the study in this context, the research has gained insight into the teacher educators' commitment to social justice and empowering teacher education as a transformative process towards social change.

The results of the study showed that the teacher educators had strong commitments to preparing future generations of teachers to dismantle and challenge aspects of the system that reinforce social inequities, thus aiming to improve the educational opportunities of all students (Cochran-Smith et al., 2009). To this end, teacher educators specifically saw their roles as 1) enacting change; 2) advocating for democracy, equity, and social justice; and 3) promoting the improvement and welfare of society. Through these roles, they aimed to encourage more emancipatory educational practices in society through pre-service teacher education (Liston & Zeichner, 1987). Teachers educated within such programs would then be prepared to identify connections between life in the classroom and wider social conditions, and they could ensure that all students have rich learning opportunities. Accordingly, it appears evident from the results of the study that the participants’ vision of being teacher educators is not limited to engaging in high-quality teaching and research or exemplified as “just good teaching” (Cochran-Smith et al., 2009), but it extends to certain roles and responsibilities in other dimensions, such as working for social change and social transformation, advocating for democracy, equity, and social justice, that may also account for preparing highly qualified future teachers. This result is remarkable especially within the context of current debates in which student teachers are criticised, both nationally and
globally, for lacking intellectual knowledge, being deskilled, and being trained as technicians who consume existing ill-conceived knowledge of “just good teaching” (Guven, 2008; Leistyna et al., 2004). In response to such concerns, the teacher educators participating in this study were more motivated by an intrinsic desire to rectify social and educational inequalities and injustices and sought to achieve this by creating learning environments that would provide prospective teachers with the mindsets and pedagogical skills needed to develop critical consciousness and help them question, recognise, and challenge perpetuated inequalities. Given that organizational culture encompasses the collective values, expectations, beliefs, and norms shared by the members of an organization (Schein, 2004), these findings may not be surprising, as Heritage University has created a distinctive organizational culture in the Turkish higher education system and a unique socio-political context since its founding (Caliskan et al., 2020). Hence, it would be reasonable to posit that the teacher educators’ beliefs and motivations regarding their roles to prepare future teachers to enact change, advocate for democracy, and promote the improvement of societies may be indicative of Heritage University’s organizational culture, as well as its deeply rooted commitment to empowering democracy and social justice and improving the quality of citizens’ lives.

Moreover, the emphasis on the participating teacher educators’ perceived roles is not surprising given the larger social, economic, and political tensions that Turkey has gone through over the last couple of years (Gokturk, Sismanoglu-Kaymaz, & Bozoğlu, 2018). That is, as part of the wider socio-political context of Turkey, the top-down approach to the teacher education curriculum has become even more prescribed by the CHE with increasing rigidity and control over teacher education reform. Thus, the teacher educators might have perceived their roles as preparing teachers who can fight oppression and challenge stereotypes and social constructs. They might also have seen their roles as recognizing and valuing teacher candidates’ individual differences and embracing their lived experiences and identities in order to raise future teachers who can strive to narrow the achievement gap resulting from several sources of inequities. Indeed, considering the growing number of students with culturally and linguistically diverse backgrounds in Turkey (Arar, Örücü, & Ak-Küçükçayır, 2019), teacher educators must work to educate prospective teachers to respond to the needs of diverse classrooms and accommodate the holistic needs of all students. However, the participating teacher educators reported that enacting their perceived roles was often difficult due to the mandated teacher education curriculum, which limited autonomy, flexibility, and the support that they could offer to pre-service teacher education to empower prospective teachers to critically examine their world.

In the light of these discussions, the teacher educators’ motivations for preparing future teachers can offer critical insights for moving pre-service teacher education beyond equipping teacher candidates with technical skills and instead creating inclusive, socially sensitive, democratic, and socially just educational environments (Kincheloe, 2012). Through such reforms, prospective teachers can be empowered as autonomous, critical thinkers who can act upon the world (Bartolomé, 2004). Moreover, given that belief structures undergird people’s decisions and actions (Bandura, 1986; Pajares, 1992), the beliefs and motivations of teacher educators may significantly shape teacher education programs and the learning experiences of teacher candidates. As such, this study has unique implications for how teacher education programs could improve their professional preparation, impact, and practices to push an agenda for social justice and equity in K-12 schools. To this end, teacher educators’ beliefs regarding their roles and responsibilities for preparing the next generation of teachers can help them face their own biases or stances regarding the purposes of education and schooling, which could further provide teacher candidates with the opportunity to develop
new eyes that can transform existing teaching practices by recognising inequities and dismantling unjust practices. This transformation would allow them to adopt practices that are congruent with the tenets of social justice. Although prospective teachers enter teacher education programs with pre-existing beliefs about schooling, teaching, and learning based on their own experiences, they can change or modify their beliefs with the help of teacher educators in pre-service teacher education. By developing new critical perspectives, future teachers can make sense of their experiences in teacher education programs (Bird, Anderson, Sullivan, & Swidler, 1992) to reflect and act upon the world in a way that promotes social change and teaching for social justice. This is especially vital as research suggests that teachers’ beliefs influence and shape their perceptions and judgments, which, consequently, impact their actions in the classroom (Pajares, 1993).

In contributing to the conversation on how teacher education programs could improve their professional preparation, the present study further addresses the crucial role of curriculum and courses as highlighted by the teacher educators. Moreover, it emphasizes the place of reflective practice and inquiry in pre-service teacher education; the importance of engaging in dialogue and collaboration with colleagues, schools, and the community; and the need for extracurricular activities to be integrated into teacher education programs. As evident in the teacher educators’ statements, the study also highlights the role of the clinical practice of teaching, mentoring teacher candidates, practical engagement with pedagogy, and the bidirectional relationship between research and practice in focusing on questions of equity and diversity. These aspects of teacher educators’ response illustrate the importance of challenging deficit notions about the capabilities of students from low socio-economic, migrant, or disadvantaged minority backgrounds in K-12 schools. Moreover, this study sheds light into certain structural and institutional sources that hinder teacher educators in higher education from fulfilling their perceived roles. Specifically, this study has highlighted challenges associated with the top-down approach to the teacher education curriculum and the rigidity of teacher education reforms (Guven, 2008; Yıldırım, 2013) as well as the ever-growing standardised testing culture underpinned by a ‘one-size fits all’ approach to schooling (Leistyna et al., 2004; McDonald & Zeichner, 2009).

Lastly, although the teacher educators expressed commitments to social justice, it is important that their intentions and beliefs are reflected in practice, which points to the formal preparation of teacher educators in terms of developing an understanding of diverse contexts, conceptual lenses, social justice issues, and pedagogical strategies (Lee, Akin, & Goodwin, 2019). While teacher educators are often assumed to be the linchpins of educational reform and are explicitly or implicitly held accountable for teacher quality (Cochran-Smith et al., 2020), they cannot model and enact what they are not prepared for (Lee et al., 2019). Thus, an essential aspect of teacher educator preparation is the need for multiple and continuing opportunities to reconsider and critique their own beliefs and assumptions pertaining to diversity and educational/social inequality, in addition to how those beliefs and assumptions are translated into teacher education policy and practice (Cochran-Smith et al., 2020).

Limitations

This study acknowledges its limitation of relying only on interview data. Therefore, it is recommended that future studies employ observations in pre-service teacher education settings to demonstrate how teacher educator beliefs influence the enactment of the teacher education curriculum. This study also acknowledges that case studies cannot be generalised to a larger context. While the findings of this study are limited to the case study institution (the
Heritage University), the current study is built on the strength of case studies as the findings are interpreted by contextualisation and comply with the notion of transferability.

**REFERENCES**


Investigating Research Trends on Digital Storytelling: A Bibliometric and Visualized Analysis

Perihan Gülce Özkaya
Muğla Sıtkı Koçman University

Abstract

Digital storytelling is a method often preferred in the education process in terms of its appeal to different senses by creating a multimedia environment, and it may also be used in the development of language skills as it often includes both textual and audio elements. The current study investigates the research trends of digital storytelling, which is one of the methods recently preferred for education and for Turkish language skills development, through an examination of the Web of Science (WoS) database. The study was designed as a descriptive study. Data obtained from 545 academic works published within the context of the study were subjected to bibliometric analysis according to six categories; number of articles and citations, most-cited articles, most-used keywords, most influential countries, most influential institutions, and most influential journals. The study also presents bibliometric network maps of the most-cited articles, most-used keywords, as well as the most influential countries, institutions, and journals. The bibliometric analyses and network maps were performed using the VOSviewer_1.6.16 program. The results of the study show that digital storytelling is a method currently preferred in education. It is thought that examining the global trends of studies undertaken on digital storytelling in education will help to guide researchers looking to work on this subject in Turkish language education or in other fields of education.

Keywords: Digital Storytelling, Education, Turkish Language Education, Turkish Language Skills, Bibliometric Analysis

DOI: 10.29329/ijpe.2022.426.21

---

1 Perihan Gülce Özkaya, Research Assist Dr., Faculty of Education, Muğla Sıtkı Koçman University, ORCID: 0000-0001-9630-9739

Email: ozkayagulce@gmail.com
INTRODUCTION

“Digital stories,” which can be defined as presenting stories in an interactive environment by enriching them with sound, music, rhythm, and visuals, has become a preferred learning tool in today’s education due to features such as its appeal to different senses and increased levels of interaction. Digital stories prepared by teachers can be used as a learning tool in the classroom, as well as a method in which the learning process is structured on the basis of students preparing digital stories themselves, either individually or collaboratively, in order to achieve gains under the guidance of their teacher. This method is known as “digital storytelling.”

Digital storytelling is considered to be an effective technological application designed to take advantage of user-generated content and also to remove obstacles to the efficient use of technology within educational environments (Robin, 2008). Digital storytelling can be employed to facilitate meaningful learning for students in harmony with the use of technology (Sadik, 2008).

In education, digital storytelling is a method that can be preferred in terms of its ability to appeal to different senses through a multimedia environment; as such, it can be used in the development of language skills as it includes both text-based and audio-based elements. It may be said that students skills can be activated through digital storytelling, such as through engaging the writing skills of students during the creation of a story’s text, which is the first stage of digital storytelling, reading aloud skills during the storytelling stage, listening skills during the story-sharing stage, and oration skills during interpretation of the shared story. In this context, digital storytelling can be said to be a multidimensional approach that can appeal to students’ comprehension (listening, reading) and expression (speaking, writing) skills.

In related studies, it has been stated that digital storytelling is an effective method in the development of Turkish language skills, that it is suitable for Turkish language teaching in terms of facilitating learning through the creating of multimedia environments, and that it can address all types of comprehension and expression skills (Duran & Ertan-Özen, 2017; Özkaya, 2020). According to this connection, digital storytelling can also be considered an effective tool in the development of competence in “communicating using the mother tongue,” which is one of the eight basic competences that should be possessed by individuals according to the Turkish Framework of Competences (Milli Eğitim Bakanlığı [Turkish Ministry of National Education], 2019) which was developed based on the European Framework of Competences in order to develop “digital competence” in K-12 students.

When the literature in this area is reviewed, it can be seen that studies have investigated the effect of digital stories on participants’ critical thinking skills (Chen & Chuang, 2021), digital literacy skills (Çetin, 2021; La Rose & Detlor, 2021), their academic achievement, learning motivation and attitudes (Kim & Li, 2021; Saritepeci, 2021), and language skills (Güvey-Aktay, 2020; Tabieh et al., 2021; Yang et al., 2020). In addition, meta-analyses have shown that digital stories can positively affect students’ academic achievement (Akgün & Akgün, 2020; Şahin & Çoban, 2020) and literacy skills (Takacs et al., 2015). In the meta-analytic and meta-thematic study conducted by Talan (2021), it was reported that the digital storytelling method can significantly affect students’ learning achievement, that it is effective in imparting 21st century skills such as critical thinking, effective communication and inquiry skills, and that it facilitates learning and increases retention. Moreover, in the meta-analysis study published by Özkaya (2020), digital stories were found to be highly influential on the development of Turkish language skills.

All of these various research results have led researchers to conduct studies on the use of digital storytelling and digital stories in education. When Turkey’s Council of Higher Education (YÖK) thesis database was examined, which is considered an important and reliable resource for data about graduate studies undertaken in Turkey, a total of 16 graduate theses were found to have investigated the effects of storytelling and digital stories on Turkish language skills. The fact that these studies were completed during the period from 2014 to 2020 shows how digital storytelling has become one of the methods more recently preferred for the development of Turkish language skills.
It is therefore considered that examining the global trend of studies published on digital storytelling in education will provide a valuable guide for researchers looking to work on this subject in Turkish language education as a research area, or in any other field of education. Accordingly, it is suggested to be important to examine a database that is predominantly accepted by the scientific world and is considered a rich source of data for researchers in terms of both quantity and quality. The Web of Science (WoS) is considered to be just such a database, accepted by the scientific world at large and includes leading citation indexes such as Science Citation Index-Expanded (SCI-Expanded), Social Science Citation Index (SSCI), Arts and Humanities Citation Index (A&HCI), Conference Proceedings Citation Index-Science (CPCI-S), Conference Proceedings Citation Index–Social Science & Humanities (CPCI-SSH), Book Citation Index–Science (BKCI-S), Book Citation Index–Social Sciences & Humanities (BKCI-SSH), and the Emerging Sources Citation Index (ESCI). As such, WoS is considered to be a large and important data source for academic researchers, and therefore researchers are encouraged to publish their research studies in journals that are indexed by WoS.

When the literature is examined, it can be seen that no study has yet been published that determines the research trends of digital storytelling. Therefore, the author decided to search the WoS database in the current study so as to investigate and determine the trends of digital storytelling research. To this end, answers to the following research questions were sought:

What is the distribution of studies on the use of digital storytelling in education, and citations to these studies by years?

What are the most-cited articles, and how are they connected on a network map?

What are the most-used keywords, and how are they connected on a network map?

What countries, institutions, and journals made the greatest contribution to the field of digital storytelling, and how are they connected on a network map?

METHOD

The current study was designed as a descriptive research. Descriptive research can be defined as the description and revelation of what already exists (Sönmez & Alacapınar, 2014). In the current study, the related works determined to examine the trend of digital storytelling in the WoS database, were analyzed through bibliometric techniques and the obtained findings then reported. The review was reported according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009). The PRISMA flow diagram of the search to identify and screen the analytical resources is presented in Figure 1.
Figure 1. PRISMA flow diagram

Data collection procedure

Data of the study were obtained through a WoS database search performed on December 17, 2020. The search criteria determined for the current study consisted of: use of the term “digital storytelling” OR “digital story” OR “digital stories” in the subject area, the inclusion of studies in the “Education and Educational Research” category, and with the search being performed on the “WoS Core Collection.” These criteria also constitute the limitations of the current study. Limitations were not placed on the year or type of publication.

From the database search performed, bibliographic data on a total of 545 academic works published in the category of education and educational research from 2004 to 2020 were retrieved and a dataset for the study subsequently created. Of these works, 340 were journal articles, 178 were conference presentations, 62 were book sections or chapters, 17 were articles opened to early access (i.e., preprint or advance online publications), 13 were educational materials, 10 were academic reviews, three were book reviews, and two were books. Overall, 526 of the retrieved academic works were written in the English language, plus 10 in Spanish, four in Portuguese, two in Russian, two in Turkish, and one in Malay Language.

Data analysis

The collected data were subjected to bibliometric analysis, which refers to the cross-disciplinary science of quantitative analysis by means of statistical and science-mapping methods (Merigó et al., 2016). Through bibliometric study, the most prominent contributors of a given field can be revealed, as too can the most influential articles and journals, and more importantly, the gradual progression of a field can be understood and visualized (Saha et al., 2020). Bibliometric analyses can be either descriptive or evaluative. While analyses aiming to determine the numbers of articles written
in a specific year are generally considered to be descriptive, those conducted to reveal how articles affected subsequent research are considered to be evaluative (Zan, 2019).

In the current study, a bibliometric analysis was conducted according to six categories; (1) numbers of articles and citations, (2) most-cited articles, (3) most-used keywords, (4) most influential countries, (5) most influential institutions, and (6) most influential journals. The data placed within each of the related categories was then presented in tabular format as well as using bibliometric network maps for the most-cited articles, most-used keywords, and the most influential countries, institutions, and journals. The bibliometric analysis and accompanying network maps were performed using the VOSviewer_1.6.16 program, which is software used especially to retrieve bibliometric data and to create visualized network maps to reveal connections between the data and for examination of the data interactively (Van Eck & Waltman, 2010). The fact that bibliometric research goes beyond definition to becomes descriptive also plays a role in the evaluation of scientific publications, and thereby contributes to the more efficient use of resources (Al et al., 2012). In this direction, descriptive data were presented in tabular format and then examined in detail through network mapping in order that the connections between the data could be described.

RESULTS

Results related to distribution of studies and citations by years

Distribution of the 545 studies retrieved from the WoS database based on the use of digital storytelling, along with a total of 3,326 subsequent citations to these studies, are presented in Figure 2 and Figure 3 for each year of the examined period.

Figure 2. Distribution of studies by year (2004-2020)
As can be seen in Figure 2, the first study on digital storytelling was published in 2004. The highest number of studies conducted on digital storytelling was in 2016 ($n = 79$), and although this number decreased in 2020 ($n = 54$), it can still be considered high. When the distribution of citations to the published articles (see Figure 3) is examined, it can be seen that the first citation was registered in 2006. The number of citations for studies on digital storytelling has shown an increasing trend over the years, with the highest being 666 in 2020.

Results related to most-cited articles

As a result of the examination of the use of digital storytelling in educational research (citation-documents), the 10 most-cited articles of the 123 that met the threshold of having attracted at least “5 citations” are presented in Table 1; whilst the corresponding network map is presented in Figure 4.

Table 1. Ten most-cited articles

<table>
<thead>
<tr>
<th>No</th>
<th>Author/s</th>
<th>Year</th>
<th>Article title</th>
<th>Journal name</th>
<th>*WoS citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Robin</td>
<td>2008</td>
<td>Digital storytelling: A powerful technology tool for the 21st century classroom</td>
<td>Theory into Practice</td>
<td>302</td>
</tr>
<tr>
<td>2</td>
<td>Sadik</td>
<td>2008</td>
<td>Digital storytelling: A meaningful technology-integrated approach for engaged student learning</td>
<td>Educational Technology Research and Development</td>
<td>226</td>
</tr>
<tr>
<td>3</td>
<td>Hull &amp; Katz</td>
<td>2006</td>
<td>Crafting an agentive self: Case studies of digital storytelling</td>
<td>Research in the Teaching of English</td>
<td>164</td>
</tr>
<tr>
<td>4</td>
<td>Yang &amp; Wu</td>
<td>2012</td>
<td>Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study.</td>
<td>Computers &amp; Education</td>
<td>155</td>
</tr>
<tr>
<td>5</td>
<td>Hafner &amp; Miller</td>
<td>2011</td>
<td>Fostering learner autonomy in English for science: A collaborative digital video project in a technological learning environment</td>
<td>Language Learning &amp; Technology</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>Hung et al.</td>
<td>2012</td>
<td>A project-based digital storytelling approach for improving students’ learning motivation, problem-solving competence and learning achievement</td>
<td>Educational Technology &amp; Society</td>
<td>87</td>
</tr>
<tr>
<td>7</td>
<td>Verdugo &amp; Belmont</td>
<td>2007</td>
<td>Using digital stories to improve listening comprehension with Spanish young learners of English</td>
<td>Language Learning &amp; Technology</td>
<td>78</td>
</tr>
</tbody>
</table>
In Table 1 and Figure 4, the most-cited articles on the subject of digital storytelling are presented. The most-cited article attracted 302 citations in WoS-indexed publications and was authored by Robin (2008) under the title, “Digital storytelling: A powerful technology tool for the 21st century classroom” and published in the Theory into Practice journal. This article is deemed one of the seminal works on the use of digital storytelling in education.

Of these 10 most-cited articles, three (Hafner & Miller, 2011; Hull & Katz, 2006; Nelson, 2006) relate to language teaching, indicating that the number of studies on the use of digital storytelling in language teaching and developing language skills can be considered fairly high. This is a significant finding, since it indicates that digital storytelling is a method preferred for the development of language skills.

**Results related to most-used keywords**

From the analysis conducted to determine the most-used keywords in the selected studies on digital storytelling (co-occurrence-author keywords), 45 keywords were identified that met the threshold of having been used a minimum “5” times, out of total of 1,349 keywords used overall. The results for the 10 most-used keywords are presented in Table 2 and a network map of the 45 keywords is illustrated Figure 5.
Table 2. Ten most-used keywords

<table>
<thead>
<tr>
<th>No</th>
<th>Keyword</th>
<th>Connections</th>
<th>Total Connection Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Digital storytelling</td>
<td>238</td>
<td>163</td>
</tr>
<tr>
<td>2</td>
<td>Digital stories</td>
<td>29</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>Storytelling</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>Technology</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>Higher education</td>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>6</td>
<td>Multimodality</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>Digital literacy</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>Digital</td>
<td>11</td>
<td>21</td>
</tr>
<tr>
<td>9</td>
<td>Blended learning</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>Pedagogy</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>

As can be seen in Table 2, the most-used keyword was revealed to be “digital storytelling” (TCP = 163; Connections = 238), followed by “digital stories” (TCP = 22; Connections = 29), “storytelling” (TCP = 19; Connections = 18), and “technology” (TCP = 18; Connections = 17). In Figure 5, it can be seen that the 45 keywords are subsumed under eight clusters (combined TCP = 339). The clusters are listed as follows: Cluster 1 is the red cluster (8 nodes), Cluster 2 is the green cluster (7 nodes), Cluster 3 is the navy-blue cluster (6 nodes), Cluster 4 is the yellow cluster (6 nodes), Cluster 5 is the purple cluster (5 nodes), Cluster 6 is the blue cluster (5 nodes), Cluster 7 is the orange cluster (4 nodes), and Cluster 8 is the brown cluster (4 nodes).

The keyword that comes to the fore in the red cluster is “motivation” (TCP = 19; Connections = 10). The other keywords in this cluster are “21st century skills,” “collaborative learning,” “language learning,” “Project-based learning,” “engagement,” “efl,” and “web 2.0.” The concepts that constitute this cluster seem related to the educational dimension of digital storytelling. Based on the clustering of the keyword “motivation,” this may be due to digital storytelling being considered to include a motivational characteristic.
The keyword that comes to the fore in the green cluster is “digital stories” (TCP = 22; Connections = 29). The other keywords in this cluster are “multimodality,” “multiliteracies,” “mobile learning,” “blended learning,” “participation,” and “student engagement.” The common characteristic of the keywords making up this cluster seem related to the suitability of digital stories for use in multimedia environments.

The keyword that comes to the fore in the navy-blue cluster is “digital” (TCP = 21; Connections = 11). The other keywords in this cluster are “media literacies,” “new literacies,” “writing,” “literacy,” and “case study.” The keywords that constitute this cluster seem to be gathered around the concept of “literacy.” The fact that the concept of “digital” comes to the fore here indicates an emphasis of “digital literacy” in this cluster.

The keyword that comes to the fore in the yellow cluster is “multimedia” (TCP = 16; Connections = 10). The other keywords in this cluster are “educational technology,” “education,” “interactive digital storytelling,” “teaching,” and “learning.” The concepts in this cluster appear to meet within the framework of the contributions that storytelling makes to multimedia and increased interaction.

The keyword that comes to the fore in the purple cluster is “digital literacy” (TCP = 22; Connections = 14). The other keywords in this cluster are “creativity,” “digital storytelling,” “primary education,” and “early childhood.” What brings these concepts together may be how studies have shown that digital literacy, as a dimension of digital storytelling, improves creativity in early age groups.

The keyword that comes to the fore in the blue cluster is “digital storytelling” (TCP = 163; Connections = 238). The other keywords in this cluster having the highest connection power are “higher education,” “teacher education,” “pre-service teacher,” and “reflective practice.” The common point of the concepts in this cluster is that they relate to the use of digital storytelling in higher education, particularly in pre-service teacher education. The high connection power found for the concept “digital storytelling” might be due to this method being widely used in teacher education, hence the number of studies in this field is seen as high.

The keyword that comes to the fore in the orange cluster is “technology” (TCP = 18; Connections = 17). The other keywords in this cluster are “digital story,” “pedagogy,” and “social inclusion.” These concepts are believed to be together due to the connection between storytelling with technology, education, and social inclusion.

The keyword that comes to the fore in the brown cluster is “storytelling” (TCP = 19; Connections = 18). The other keywords in the cluster are “reflection,” “professional development,” and “technology-enhanced learning.” The concepts here emphasize that the use of digital storytelling is closely associated with both professional development and reflection.

**Results related to most influential countries**

As a result of the analysis conducted to determine the most influential countries in terms of having contributed to the field of digital storytelling (citation-countries), 23 out of 63 countries were found to have met the threshold value of having at least “5” works published, with at least “1” subsequent citation in a WoS-indexed journal, on digital storytelling. The data of the 10 most influential countries in the field of digital storytelling are presented in Table 3 and the corresponding network map is shown in Figure 6.
Table 3. Ten most influential countries

<table>
<thead>
<tr>
<th>No</th>
<th>Country</th>
<th>Citations in WoS</th>
<th>Articles</th>
<th>Total Connection Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United States</td>
<td>1,314</td>
<td>120</td>
<td>310</td>
</tr>
<tr>
<td>2</td>
<td>Taiwan</td>
<td>327</td>
<td>21</td>
<td>168</td>
</tr>
<tr>
<td>3</td>
<td>Australia</td>
<td>191</td>
<td>34</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Canada</td>
<td>157</td>
<td>35</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>United Kingdom</td>
<td>154</td>
<td>42</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>Spain</td>
<td>151</td>
<td>33</td>
<td>66</td>
</tr>
<tr>
<td>7</td>
<td>Turkey</td>
<td>128</td>
<td>43</td>
<td>245</td>
</tr>
<tr>
<td>8</td>
<td>China</td>
<td>128</td>
<td>10</td>
<td>46</td>
</tr>
<tr>
<td>9</td>
<td>South Korea</td>
<td>119</td>
<td>5</td>
<td>63</td>
</tr>
<tr>
<td>10</td>
<td>Romania</td>
<td>116</td>
<td>14</td>
<td>42</td>
</tr>
</tbody>
</table>

Figure 6. Network map of most influential countries

Data regarding the most influential countries in the field of digital storytelling are presented in Table 3 and a network map of their connections illustrated in Figure 6. As can be seen, the United States is clearly the most influential country in the field (articles = 120; citations = 1,314; TCP = 310). Turkey ranks second in terms of the number of academic works published and seventh in the number of citations. Thus, it can be argued that Turkey has made an important contribution to the field (articles = 43; citations = 128; TCP = 245). When the data are examined in terms of cooperation between countries, it can be seen that Turkey works in cooperation with countries such as the United States and New Zealand.

When the contribution of Turkey to the trend in WoS is examined, it is seen that from among Turkey’s 43 articles, the highest number of citations (n = 29) was to the article entitled “The effect of digital storytelling on visual memory and writing skills,” which was authored by Cıralı-Sarıca and Koçak-Usluel (2016) and published in the Computers & Education journal. This is followed by an article titled “A phenomenological study: Teachers’ experiences of using digital storytelling in early childhood education,” which was written by Yüksel-Arslan et al. (2016) and published in the Educational Studies journal, and with six subsequent citations in WoS-indexed journals. The other articles related to Turkish language skills that were also indexed in WoS are Cigerci and Gultekin’s (2017) “Use of digital stories to develop listening comprehension skills,” which was published in Issues in Educational Research (citations = 6), Girmen and Kaya’s (2019) “Using the flipped classroom model in the development of basic language skills and enriching activities: Digital stories and games,” which was published in the International Journal of Instruction (citations = 4), Korkmaz
and Güneyli’s (2017) “Impact of technology-assisted context-based teaching on the listening skills of teacher candidates,” which was published in the Eurasia Journal of Mathematics, Science and Technology Education (citations = 3), Dayan and Girmen’s (2018) “Turkish education writing process: Digital storytelling” which was published in the Journal of Qualitative Research in Education (citations = 0), and Tanrıkulu’s (2020) “Students’ perceptions about the effects of collaborative digital storytelling on writing skills,” which was published in Computer Assisted Language Learning (citations = 0). When the general citation data of the 43 Turkish articles on digital storytelling in WoS are examined, it can be seen that 26 articles have at least one subsequent citation, but that 17 articles have yet to be cited in WoS-indexed journals.

Results related to most influential institutions

As a result of the analysis conducted to determine the most influential institutions contributing to the field of digital storytelling (citation-organization), 17 out of the 552 institutions having published academic works on digital storytelling were determined as having met the threshold of at least “5” articles published that subsequently attracted at least “1” citation in a WoS-indexed journal. Data for the most influential institutions in the field of digital storytelling are presented in Table 4 and their network map is shown in Figure 7.

Table 4. Ten most influential institutions

<table>
<thead>
<tr>
<th>No</th>
<th>Institution</th>
<th>Citations in WoS</th>
<th>Articles</th>
<th>Total Connection Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Houston</td>
<td>406</td>
<td>7</td>
<td>52</td>
</tr>
<tr>
<td>2</td>
<td>National Central University</td>
<td>54</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>University of Technology Sydney</td>
<td>49</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Cape Peninsula University of Technology</td>
<td>39</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Nanyang Technological University</td>
<td>33</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td>Nottingham Trent University</td>
<td>29</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>University of the Aegean</td>
<td>26</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>University of Valencia</td>
<td>25</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>9</td>
<td>University of British Columbia</td>
<td>24</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>University of Oviedo</td>
<td>19</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Figure 7. Network map of most influential institutions
As can be seen from both Table 4 and Figure 6, the institution that made the most significant contribution to the field in terms of the number of articles published was the “Cape Peninsula University of Technology” (articles = 14; citations = 39; TCP = 5), while the institution that made the greatest contribution in terms of the number of citations in WoS-indexed journals that their articles subsequently amassed and total connection power was “University of Houston” (articles = 7; citations = 406; TCP = 52). Additionally, the “University of Houston” also seems to be one of the prominent institutions in the field of digital storytelling. The researcher having the highest number of citations in the field, Dr. Bernard Robin works at this institution and was responsible for opening the Centre of Educational Uses of Digital Storytelling in 2004. Moreover, since 2008, the Digital Storytelling Contests have been organized under the leadership of Dr. Bulent Dogan also from the “University of Houston.” These achievements perhaps go a long way to explaining how the University of Houston has made such a significant contribution to the field in terms of the number of citations and total connection power.

**Results related to most influential journals**

From the analysis conducted to determine the most influential journals in the field of digital storytelling (citation-source), 13 out of the 323 journals having articles published on digital storytelling were found to meet the threshold of at least “5” articles having been published which had subsequently cited been at least “1” time in a WoS-indexed journal. Data showing the most influential journals in the field of digital storytelling are presented in Table 5 and the corresponding network map is illustrated in Figure 8.

<table>
<thead>
<tr>
<th>No</th>
<th>Journal name</th>
<th>Citations in WoS</th>
<th>Articles</th>
<th>Total Connection Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Computers &amp; Education</td>
<td>269</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Educational Technology Research &amp; Development [ETR&amp;D]</td>
<td>253</td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>Educational Technology &amp; Society</td>
<td>182</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>4</td>
<td>Learning Media and Technology</td>
<td>76</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Journal of Geography in Higher Education</td>
<td>59</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Journal of Adolescent &amp; Adult Literacy</td>
<td>45</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Digital Education Review</td>
<td>42</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>8</td>
<td>Reading Teacher</td>
<td>41</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Computer Assisted Language Learning</td>
<td>31</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>10</td>
<td>Journal of E-Learning and Knowledge Society</td>
<td>13</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Educational Media International</td>
<td>3</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>Edulearn15 Proceedings</td>
<td>2</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>Edulearn18 Proceedings</td>
<td>1</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>
As can be seen in Table 5, the journal that attracted the highest number of citations in other WoS-indexed journal publications and total connection power was “Computers & Education” (number of articles = 5; number of citations = 269; TCP = 36). Figure 8 depicts that the 13 most influential journals are in fact clustered around just five (combined TCP = 95). The clusters are presented as follows: Cluster 1 is the red cluster (5 nodes), Cluster 2 is the green cluster (2 nodes), Cluster 3 is the navy-blue cluster (2 nodes), Cluster 4 is the yellow cluster (2 nodes), and Cluster 5 is the purple cluster (2 nodes). The journals that come to the fore within each of the clusters are determined according to their total combined connection power.

The journal that comes to the fore in the red cluster is “Computers & Education” (TCP = 36; Connections = 10). This is a journal that features both theoretical and practical works on the use of digital technology in education. The impact factor of the journal is 5.296.

The journal that comes to the fore in the green cluster is “Educational Technology & Society” (TCP = 33; Connections = 8). It is a journal that maintains its focus on how learning, teaching, and evaluation are affected by long-term technology applications. The journal’s impact factor is 2.086.

The journal that comes to the fore in the navy-blue cluster is “Computer Assisted Language Learning” (TCP = 21; Connections = 7). This journal is an interdisciplinary journal publishing both theoretical and practical studies on computer-assisted applications. Its impact factor is 2.642, and is a journal often preferred for the publishing of studies investigating language teaching through technological applications.

The journal that comes to the fore in the yellow cluster is “Educational Media International” (TCP = 11; Connections = 4). This is a scientific journal that publishes studies that aim to address the problems and difficulties encountered in the development, application, and evaluation of media in education. The impact factor of the journal is 0.77.

Finally, the journal that comes to the fore in the purple cluster is “Digital Education Review” (TCP = 17; Connections = 6). This journal includes studies that are designed to investigate the effect
of communication technologies on education, as well as innovative teaching and learning methods in
digital environments. Its impact factor as a journal is 0.80.

**DISCUSSION, CONCLUSION AND SUGGESTION**

The current study aimed to examine the trends of digital storytelling in the Web of Science (WoS) database. As such, the bibliographic data of 545 academic works published in the category of educational research from 2004 to 2020 were retrieved and the obtained data then subjected to bibliographic analysis within six categories.

According to the results of the bibliographic analysis, there were a total of 3,326 citations made to the 545 studies in WoS-indexed journals. The number of the studies published on digital storytelling and the citations subsequently made to these studies was found to have an increasing trend over the examining period. This shows that digital storytelling is a method preferred in the education field. In addition to the many individual studies that have investigated the use of digital storytelling in education (Kim & Li, 2021; Saritepeci, 2021), there have been meta-analyses conducted that have shown that digital storytelling can positively affect students’ academic achievement (Akgün & Akgün, 2020; Sahin & Çoban, 2020) as well as their literacy skills (Takacs et al., 2015). Meta-analysis and meta-thematic studies have shown that digital storytelling is effective in imparting 21st century skills to learners such as creative thinking, effective communication, and research skills (Talan, 2021). The high effect sizes obtained from these studies point to why digital storytelling has become preferred in the field of education.

The most-cited article was “Digital storytelling: A powerful technology tool for the 21st century classroom,” which was published in the Theory in Practice journal by Robin in 2008. This appears to be a seminal work in the field of digital storytelling. Determination of the most-cited article may help to guide future researchers who are planning to conduct research on the use of digital storytelling in education. Three of the 10 most-cited articles were found to be in the field of language teaching (Hafner & Miller, 2011; Hull & Katz, 2006; Nelson, 2006), indicating the importance attached to digital storytelling in language teaching. Other studies have shown that digital storytelling can improve the language skills of study participants (Güvey-Aktay, 2020; Tabieh et al., 2021; Yang et al., 2020). This finding was also supported in the meta-analysis conducted by Özkaya (2020), which concluded that digital stories can highly affect the development of Turkish language skills. Also, when Turkey’s Council of Higher Education (YÖK) thesis database was examined, a total of 16 graduate theses were found to have investigated the effects of storytelling and digital stories on Turkish language skills. The fact that these studies were completed during the period from 2014 to 2020 shows how digital storytelling has become one of the methods more recently preferred for the development of Turkish language skills. This is similar to the fact that the studies on digital storytelling in education in the WoS database and the citations to these studies show an increasing trend in 2014 and later. In this context, it can be said that digital storytelling has been a preferred method in the development of Turkish language skills in recent years.

The most-used keyword was found to be “digital storytelling,” whilst the United States was found to be the country that made the greatest contribution to the field of digital storytelling. Turkey was shown to rank second in terms of contribution to the field in terms of the number of articles and seventh in terms of the number of citations. When the contribution of Turkey to the trend in WoS is examined, it can be seen that from among Turkey’s 43 articles, the highest number of citations (n = 29) was for the article entitled “The effect of digital storytelling on visual memory and writing skills,” which was authored by Çıralı-Sarca and Koçak-Usluel (2016). When the general citation data of the 43 Turkish articles on digital storytelling in WoS were examined, it was seen that 26 articles had at least one citation, but that 17 articles had not yet been cited. Also 6 articles on Turkish language skills (Çiğerci and Gültekin, 2017; Çıralı-Sarca and Koçak-Usluel, 2016; Dayan and Girmen, 2018; Girmen and Kaya, 2019; Korkmaz and Güneyli, 2017; Tanrıku, 2020) were found in WoS, and it was determined that 4 of these articles (Çiğerci and Gültekin, 2017; Çıralı-Sarca and Koçak-Usluel,
2016; Girmen and Kaya, 2019; Korkmaz and Güneyli, 2017) were cited. In this context by increasing the number of references made to articles sourced from academicians affiliated with Turkish institutions, it is likely that Turkey’s power in the field would increase.

The institution that made the greatest contribution to the field of digital storytelling in terms of the number of articles published was the “Cape Peninsula University of Technology,” whilst the institution whose works drew the greatest number of citations and total connection power was the “University of Houston.” In future, researchers looking to conduct research in the area of digital storytelling may wish to follow studies published by academicians working at these institutions.

The most influential journal in the field of digital storytelling was found to be “Computers & Education.” Determination of the most influential journals in the field of digital storytelling can aid researchers to find the right journal in which to publish their studies, and also for the purposes of following the current research in the area. Additionally, researchers looking to follow the latest research on the use of digital storytelling for the purposes of developing language skills, and/or to publish their own research on this subject, may wish to consider the “Computer Assisted Language Learning” journal.

Based on the results of the current research, it may be stated that digital storytelling is a preferred method of teaching in education. In light of these findings, further research could be conducted on the use of digital storytelling in the Turkish language teaching context and in the development of Turkish language skills, as in all areas of education, and that researchers should be encouraged to publish studies in journals listed within databases recognized by the scientific world as well-founded and authoritative resources of academic literature. Also, it is considered that examining the global trend of studies published on digital storytelling in education will provide a valuable guide for researchers looking to work on this subject in Turkish language education as a research area, or in any other field of education. Therefore, the number of studies examining these trends can be increased.

REFERENCES

(* The most cited researches marked with an asterisk indicate the studies included in the bibliometric analysis)


Milli Eğitim Bakanlığı. (2019). *Türkçe Dersi (İlkokul ve Ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. Sınıflar) Öğretim Programı [Turkish Language Course (Primary and Secondary School 1, 2, 3, 4, 5, 6, 7 and 8th. Grades) Curriculum]. http://mufredat.meb.gov.tr/Dosyalar/20195716392253-


Primary School Teachers’ Perceptions of Digital Culture*

Nur Özge Menşan ¹
Eskisehir Osmangazi University

Şengül Saime Anagün ii
Eskisehir Osmangazi University

Abstract

Children born into the digital world and grow up with digital tools begin to surf the internet, download files, play games and engage in many different digital activities from an early age. Because these children who grow up in the digital world are exposed to various digital experiences, their brains are constantly renewed, and children are entirely different from their teachers. This study aims to determine the digital profiles of primary school teachers and reveal their opinions about creating a digital culture environment in their classrooms. The findings obtained from the research showed that the majority of the classroom teachers are digital hybrid, the majority of the others are digital immigrants, and very few are digital natives. When the opinions of primary school teachers on the concept of digital culture are examined, it is seen that each teacher in three profiles has basic information about digital culture. The research results reveal that the majority of participating teachers have a digital hybrid profile, who both adopt the use of digital tools and cannot give up traditional methods.

Keywords: Digital Culture, Digital Immigrant, Digital Hybrid, Digital Native, Primary School Teachers

DOI: 10.29329/ijpe.2022.426.22

* This study is a part of the master thesis of the first author under the supervision of the second author. It was supported by Scientific Research Projects Fund of Eskisehir Osmangazi University with the project number: 2018-2337

¹ Nur Özge Menşan, Expert, Elementary Education, Eskisehir Osmangazi University, ORCID: 0000-0002-6735-6218

Correspondence: ozgemensan@gmail.com

ii Şengül Saime Anagün, Prof. Dr., Elementary Education, Eskisehir Osmangazi University, ORCID: 0000-0002-8011-0730
INTRODUCTION

COVID-19 pandemic has dramatically affected many areas such as health, tourism, and the economy. Education is the second most affected sector after the health sector worldwide (Yamamoto Telli & Altun, 2020). COVID-19 crisis has made it possible to understand that the school is not the only place where education occurs. While education systems have responded to the COVID-19 crisis with distance education, they have also taken steps to restructure the education systems. Therefore, to prepare for a new crisis, countries have started to focus on blended learning models that mix face-to-face education with distance education. According to Becker et al. (2016), mobile or ubiquitous learning involves using easily moveable computing devices (such as iPads, Laptops, tablet PCs, PDAs, and smartphones) with an internet capability, which makes teaching and learning extend beyond the traditional face-to-face setting. Teachers of online programs will need 21st-century teaching skills and use various web technologies to accomplish their tasks. Teachers face technological advances that can complement or inhibit instruction (Morrison & Lowther, 2015). Although teachers closely follow the changes taking place today and have to keep up with the changes, there is a significant difference between the digital generations’ experiences and today’s teachers’ educational experiences. Today’s learning preferences include flexibility in the learning environment, collaboration (teamwork), student-based projects that incorporate challenging assignments, and, most importantly, respect for student voices (Clare, 2013).

Digital Culture, which emerged as a response to the needs of modern life in the middle of the 20th century and has spread rapidly to various fields, forms a generation that knows the language of digital tools, performs multiple operations with digital tools, and has a high-level of thinking skills. However, it can be argued that today’s education system and the teachers who continue using traditional teaching methods cannot fully meet the conditions necessary for the generation of digital culture. Besides, these teachers cannot adequately address the needs of 21st-century learners, also called digital natives (Gere, 2008; Inci, Akpinar & Kandir, 2017). Therefore, the inclusion of digital tools in the process of teaching and learning to enable digital native students to learn more easily will be supportive in terms of students' learning processes. (Kivunjia, 2014). In addition, teachers need to progress themselves and their skills to use digital tools that enable their students to learn effectively, efficiently, and accurately (Capogna, 2016).

There is an increasing concern among society over the need for teachers to be digitally competent (Fernández-Batanero et al. 2020). This reason requires training for qualified teachers who can use technology to educate their students in a digital era fully. The most important thing that teachers can do is to adapt themselves to the habits and information processing methods of digital natives, accept digital tools as part of their lives, and use technology effectively by accepting the rapid change of technology (Tapscott, 1998; Prensky, 2001; Oblinger & Oblinger, 2005). Today, digital hybrid teachers possess both digitally native and digital immigrant characteristics and both digital native and digital immigrant characteristics and digital immigrant teachers who were born before the digital age and later met this world. However, teachers in hybrid profiles need to develop their knowledge, skills, and competencies and update themselves as much as a digital native does to be able to educate individuals who can easily adapt to societal and social changes experienced in the 21st century (Pedro, 2006; Gunther, 2007).

Digital culture and digital profiles

Since the 1980s, technological innovations with computer and digital technologies have shaped every aspect of our lives, including our behaviors, thoughts, learning, and even our understanding of who we are. The concept of digital refers not just to the effects and possibilities of a particular technology. It also defines and encompasses the ways of thinking and doing embodied within that technology and make its development possible. Besides, digital technology includes abstraction, codification, self-regulation, virtualization, and programming (Gere, 2008). The digital culture that emerged in the mid-20th century as a response to the needs of modern life has created a generation that knows the language of digital tools well can perform multiple operations with digital
tools and has higher-order thinking skills (Inci, Akpınar & Kandir, 2017). Digital culture is a concept that explains the idea that technology and the internet significantly shape the way human beings interact, behave, think, and communicate in a societal setting. Digital culture is defined as a new way of life that develops due to rapid access to information accelerated by computers, the internet, and smartphones (Karagozoglu Asliyuksek, 2015). Another concept that emerged with digital culture is digital division. Van-Dijk (2005) summarizes digital division as the inadequate access to information and communication technology resources due to the individuals’ personal and social characteristics, inequalities brought about by the individuals’ participation in social life, and relevant deficiencies in the use of information and communication technology resources.

Some researchers state that the side of this digital division on which an individual is placed may be affected by his/her level of income, educational status, profession, gender, ethnicity, intelligence, and health, as well as by the gap between generations. (Norris, 2001; Van Dijk, 2005). Teachers have been identified as the key players in integrating technology in teaching and learning (Li, Worsh, Zhou & Aguiton, 2015). The digital divide between generations is first put forward by Prensky (2001). Anderson (2005), Gaston (2006), and Oblinger & Oblinger (2005) agree with Prensky’s studies, which have resulted in the emergence of different digital profiles. Even though there are various ways to define digital natives and immigrants, the generation gap exists among teachers. Although some of today’s teachers were not born in today’s digital world, they have become involved with the use of technology and have equally adopted many aspects of Information and Communication Technologies (ICTs) in their classes at some later point in their lives. Prensky (2001) identifies two demographic groups based on the level of technology immersion. “Digital natives” and “Digital immigrants” are explained in the proceeding section.

**Digital natives**

Digital natives, born in and after 1980, refer to the generation which exists within the digital culture and whose lives are surrounded by the tools of the digital age. They are called digital natives because they are a generation that accepts digital tools as a part of their lives, adopts the existence of technology in their daily life routines, and has native-like fluency in the digital language of the internet video games, and computers. Digital natives are people who have grown up with the internet and considered the internet as an unquestionable tool (Prensky, 2001; Pedro, 2006; Ransdell, Kent, Gaillard-Kenney & Long, 2011). Prensky (2001) points out that digital natives are comfortable, confident, and more positive towards technology use than digital immigrants because they grew up with easy access to computers, the internet, and other ubiquitous ICT devices (Li, Wang & Lei, 2019).

**Digital immigrants**

Digital immigrants are individuals who were not born in the digital age but later met the digital world and therefore the digital language of this world with an accent (Prensky, 2001; Dingli & Seychell, 2015; Baran-Gorgun, Kurt-Kocak & Tekeli-Serdar, 2017). According to Palfrey & Gasser (2008), digital immigrants were born before the digital age and for whom digital technology is not important at all, but who has tried to keep up with it in certain stages of their lives. Based on the literature review, no criteria commonly define digital immigrants: age and accessibility (Bannon & Thomas, 2014; Bowe & Wohn, 2015). However, studies also show that accessibility cannot guarantee technology use (Lei, 2009). Some other factors are considered to picture the two generational groups, such as experiences (Tapscott, 2009), socioeconomic status (Ferro, Helbig & Gil-Garcia 2011), regional development level (Helsper & Eynon, 2010), and computer self-efficacy (Teo, 2015). Digital immigrants are defined as individuals who continue their lives in the new culture, which poses a different lifestyle than they have already been familiar with, either by trying to keep up with today’s contemporary culture or resisting to adapt to it (Prensky, 2001; Toledo, 2007). Some digital immigrants refuse to use technology and digital tools, while others feel that they have to adapt to the development of digital culture and unwillingly incorporate technology and digital tools into their lives. Such immigrants first go for printed materials to obtain information and need a manual to use any technological product or program. It is understood from the increase in their use of social media that
digital immigrants, who were keen on technology for information purposes previously, have started to spend time in digital environments to chat and entertain. Today, many digital immigrants have learned to use social media, send e-mails, and even make video calls over time (Prensky, 2001; Palfrey & Gasser, 2008; Turkoglu, 2010; Zur & Zur, 2011; Baran Gorgun, Kurt-Kocak & Tekeli-Serdar, 2017).

**Digital hybrids**

In addition to Prensky's (2001) "digital native" and "digital immigrant" concepts, Palfrey & Gasser (2008) propose the concept of "digital nomad" and Toledo's (2007) of "digital tourist" as the third one. Yildiz-Kakirman (2012) also proposes a new concept to soften the concepts of digital native and digital immigrant, which has been previously proposed by Prensky (2001) by making sharp divisions in categorizing the digitalization of individuals. Yildiz-Kakirman (2012) administers a questionnaire and analyses the knowledge acquisition approaches of 382 students studying at Marmara University based on the assumption that they represent Prensky's digital native group born in and after 1980. As a result of her research, Yildiz-Kakirman (2012) suggests that digital natives should be defined as those born after 2000, not those born in and after 1980 and that those born between the years 1970 and 1999 should be defined as "digital hybrids." According to Yildiz-Kakirman's definition (2012), digital hybrids have similar and different characteristics with both digital natives and digital immigrants. Although digital hybrids try to follow and use technological developments, they cannot use technology as effectively as digital natives. On the other hand, although they are still close to paper and printed materials, digital hybrids do not resist technology contrary to their digital immigrant counterparts.

It is the responsibility of teachers to develop digital competencies for students in their classes. Students who have experienced technology-supported learning during primary school years will continue learning with evolving technologies throughout their lives (Spiteri & Chang Rundgren, 2017). In the changing education system with COVID-19, determining the digital culture perceptions of primary teachers is also important in knowing the quality of education realized in the digital media. Although teachers are expected to be digital natives to meet the learning needs of the new generation, it is known that there are digital hybrid teachers who have no digital competence or who try to adapt to the system and use technology but do not give up old methods. To meet the needs and expectations of the new generation born into the digital age, knowing the teachers' perspectives towards digital culture and digital tools are worthy (Yilmaz-Karaoglan & Eyuboglu-Binay, 2018). Accordingly, it is expected that the results obtained from this research can shed light on policies to increase the quality of education by examining primary school teacher’s digital profiles and their perceptions of digital culture. This study aims to determine the digital profiles (digital native, digital immigrant, digital hybrid) of primary school teachers by their perceptions of digital culture and then reveal their opinions about creating a digital cultural environment in the classroom. This study, therefore, addresses the following research questions:

- How are the primary school teachers categorized in terms of their digital profiles?
- What are the perceptions of primary school teachers concerning the concept of digital culture?
- What are the perceptions of primary school teachers concerning creating a digital cultural environment?

**METHOD**

**Research design**

In this research, a mixed-method research design was used. A mixed methods research design is a procedure for collecting, analyzing, and mixing quantitative and qualitative methods in a single study (Creswell & Clark, 2011). The main reason for using mixed methods is to better understand the
research problem compared to using quantitative or qualitative data alone. An explanatory sequential mixed methods design was used in this research to collaborate the results. An explanatory sequential mixed methods design first collects quantitative data and then collects qualitative data to help explain or elaborate on the quantitative results. In this sense, explanatory sequential design (QUANTITATIVE→qualitative) was utilized to cross-validate the results from the quantitative data with those from qualitative data. In this research, quantitative data was collected and analyzed before qualitative data.

**Population and sample of the study**

The population for the quantitative dimension of this study included approximately 1600 primary school teachers working in Odunpazari and Tepebasi central districts of Eskisehir province. Thus, the study sample was 646 primary school teachers who agreed to participate in the study voluntarily. All 646 teachers responded to a scale for the quantitative dimension of this study, while a total of 11 teachers, three digital natives, three digital hybrids, and five digital immigrants, participated in the qualitative dimension. These 11 teachers agreed to participate voluntarily in this study among the 70 teachers whose school and class information was previously requested during the quantitative data collection phase.

**Data collection**

**Quantitative data collection instrument**

The study's quantitative data was collected by using the "Digital Native, Digital Immigrant, and Digital Hybrid Teacher Scale" after obtaining the necessary permissions from the developers of the instrument, Sad & Donmus (2017). This 17-item scale has three sub-dimensions: a) organization of learning environments, b) communication with parents and students, and c) personal and professional development. The Organization of learning environments sub-dimension is related to whether teachers preferred to use traditional methods or digital tools more in teaching and preparing learning environments. Communication with parents and students sub-dimension is about what kind of communication teachers prefer with students and parents in the communication process inside and outside of the classroom. Finally, in the personal and professional development sub-dimension, it is discussed whether teachers benefit from printed materials or digital media in their personal and professional development.

<table>
<thead>
<tr>
<th>Sub-dimensions</th>
<th>Sample item</th>
</tr>
</thead>
<tbody>
<tr>
<td>organization of learning environments</td>
<td>Preparing materials, resources, and activities for students</td>
</tr>
<tr>
<td></td>
<td>Preparing learning environments</td>
</tr>
<tr>
<td></td>
<td>Developing measurement tool</td>
</tr>
<tr>
<td>communication with parents and students</td>
<td>Out-of-class interaction with the students</td>
</tr>
<tr>
<td></td>
<td>Sharing information about the student's personal development with his / her</td>
</tr>
<tr>
<td></td>
<td>family</td>
</tr>
<tr>
<td></td>
<td>Involving families in school and classroom activities</td>
</tr>
<tr>
<td>personal and professional development</td>
<td>Providing personal development</td>
</tr>
<tr>
<td></td>
<td>Developing professional knowledge, skills, and competencies</td>
</tr>
</tbody>
</table>

The researchers calculated the reliability coefficient (Cronbach Alpha) of the scale as 80,9. In this study, the reliability coefficient of the scale (Cronbach Alpha) was calculated as 80,7.

**Qualitative data collection**

For the qualitative research phase, semi-structured interviews were used to obtain information from teachers about their opinions concerning the concept of digital culture and creating a digital cultural environment. This technique was chosen because it gives the researcher flexibility in terms of the questions. During the quantitative data collection process, 11 (five digital immigrants, three digital
hybrids, and three digital natives) teachers were interviewed among the 70 teachers who agreed to participate in the qualitative process. The questions mainly aimed to find out the teachers’ points of view and opinions concerning digital culture and their technology practices in their learning environments. Before preparing the interview questions, national and international literature on the research topic was reviewed. Later, the interview questions were prepared by the researchers based on the literature review and expert opinion. The interview form was finalized through the expert opinions of three academicians experienced in qualitative research. The final form of the questions was directed to two academicians for pilot application. Interviews were conducted based on an interview schedule.

**Data analysis**

**Quantitative data analysis**

The answers to the "Digital Native, Digital Immigrant, and Digital Hybrid Teacher Scale" were transferred to the computer by the researcher, and the quantitative data were analyzed by using SPSS 21 package. The digital profiles were determined using percentage and frequency distributions. Table 2 shows the scoring ranges used to determine teachers’ digital culture profiles.

<table>
<thead>
<tr>
<th>Range</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3 and -1</td>
<td>Digital Immigrant (DI)</td>
</tr>
<tr>
<td>-0.09 and +0.09</td>
<td>Digital Hybrid (DH)</td>
</tr>
<tr>
<td>+1 and +3</td>
<td>Digital Native (DN)</td>
</tr>
</tbody>
</table>

As indicated in Table 2, the two opposite sides were identified as digital immigration (-3) and digital nativeness (+3), and the midpoint as digital hybridity (0). Given the interpretation of the scores obtained from the scale, the total score was first divided by the number of items. Thus, participants who scored -3 to -1 points were considered digital immigrants, -0.09 to +0.09 points as digital hybrids, and +1 to +3 points as digital natives.

**Qualitative data analysis**

In the analysis of qualitative data, a descriptive analysis technique was used. In the thematic descriptive analysis, the themes are determined by extracting the data and considering the concepts. Data analysis initially included creating codes and then developing the themes out of the set of codes. To ensure trustworthiness in qualitative data analysis, two field experts were asked to provide feedback for the codes and the themes created. Some revisions were made when there were disagreements among them. Direct quotations from the teachers’ responses (T) were used while reporting the findings, and the participants were named T1, T2, T3, and so on.

**RESULTS**

This part of the study includes research results and comments on the results.

**The distribution of the primary school teachers by their digital profiles**

The percentage and frequency distributions of the primary school teachers’ digital profiles are shown in Table 3
Table 3 Percentage and frequency distributions of primary school teachers’ digital profiles

<table>
<thead>
<tr>
<th>Digital Profile</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Immigrant</td>
<td>150</td>
<td>23.2</td>
</tr>
<tr>
<td>Digital Hybrid</td>
<td>474</td>
<td>73.4</td>
</tr>
<tr>
<td>Digital Native</td>
<td>22</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>646</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 3, 150 (23.2%) of the 646 primary school teachers who participated in the study were digital immigrants, 474 (73.4%) were digital hybrids, and 22 (3.4%) were digital natives. When the digital profiles of the primary school teachers were examined, it was seen that they predominantly exhibited the characteristics of digital hybrids that both benefited from digital tools yet could not do without printed materials.

The findings on the primary school teachers’ perceptions of the concept of digital culture

The primary school teachers’ perceptions about the concept of digital culture were categorized by the digital profiles of the participants and the findings from the different views of teachers with different profiles.

Upon examining the opinions of digital immigrants, digital hybrid, and digital native primary school teachers on the concept of digital culture, it was seen that each teacher in the three profiles had basic yet simple information about digital culture. Although it was found that teachers used a similar expression in their definitions, it could be said that digital native teachers had a more qualified definition compared to the teachers included in the other profiles, and they had more commands of the components of digital culture.

When the responses of the five digital immigrant teachers regarding the definition of digital culture were examined, it could be argued that although they were far from digital culture, they defined digital culture. Two digital immigrant teachers simply defined digital culture as "the culture that enters our lives with computers and the internet." One of these teachers expressed his opinion on this definition. As stated by T8, "Digital culture is the culture that emerges with the introduction of computers and the internet into our lives." T3, who did not limit digital culture only as computers and the internet and used more general expressions, said, "Digital culture is the culture created by the innovations in our age." On the other hand, T10 defined digital culture as a culture that we acquired, not an emerging culture. Thus, she became one of the teachers who expressed the definition of digital culture most accurately. As defined by T10, "Digital culture is the culture we have acquired through digital tools and digital means."

Teachers’ views on the competencies of primary school teachers in digital culture

When digital immigrant, digital hybrid, and digital native teachers were interviewed about their views on the competencies of primary school teachers in digital culture, teachers of all three profiles agreed that primary school teachers were alienated from technology and digital tools.

While digital immigrant teachers stated that young teachers used digital tools and technology effectively, but teachers over a certain age were reluctant to do so, digital hybrid teachers indicated that some teachers followed the innovations in technology and digital tools and tried to use them. However, some refused to learn by resisting innovation. For example, a digital hybrid teacher stated her opinions as in the following:

T4: Young teachers follow the digital culture and the innovations it has brought. Teachers who are about to retire have no interest in such issues. That is, we, as young teachers, are curious about these issues, and we keep up with them. Still, unfortunately, some of our teachers who are about to retire and over a certain age are not eager to follow the developments and keep up with the innovations (T4).
Given the competencies of primary school teachers towards a digital culture, digital native teachers stated that the teachers over a certain age showed no significant differences in terms of their views of technology and their digital competencies compared to other teachers. For instance, a digital native teacher shared his opinions on the issue as follows:

T1: I think 90% of teachers are not into technology. Especially the teachers over a certain age are distant. I think this is due to the lack of technology and digital tools when they first took up the profession (T1).

Considering the views of the teachers about using technology in their learning environments, it can be argued that age or teaching experience is crucial for designing learning environments. While young teachers are willing to use technology in their learning environments, experienced or older teachers prefer more traditional learning environments.

Primary school teachers’ views for the effect of digital culture competencies on the learning and teaching process

While digital immigrant teachers stated that they did not use their digital competencies in the learning and teaching process for limitations, inadequacies, and lack of self-sufficiency, some digital teachers noted that these competencies positively affected the learning and teaching process. When the data obtained from the interviews of digital hybrid teachers, who were already identified in the light of the scale results, were examined, the features of digital hybridity were more clearly seen. For example, while some of the digital hybrid teachers stated that they tried to use both traditional methods and digital tools as much as possible, some digital hybrid teachers declared that accurate and proper use of digital tools was important in the learning and teaching process depending on the subject and student competencies.

Digital native teachers thought that teachers’ competencies in digital culture positively affected the learning and teaching process, thereby leading to positive multifaceted effects such as the efficiency of the class and good relationships with students. They also stated that these competencies were both motivating and that they enriched the learning and teaching process. For instance, a digital native teacher shared his opinions on this issue as follows:

T1: Children are now keen on the sort of homework that requires using technological tools. For example, I assigned digital storytelling homework to children the other day, and the whole class did. Children are interested, and they want me to assign homework like this all the time (T1)

Although the digital profiles of the teachers were different, almost all of them stated that technology usage competencies had positive effects on the learning environments and students’ motivation. On the other hand, the teachers also noted the limitations for technology usage in their classrooms, such as insufficiency of the physical environment and lack of self-sufficiency. However, teachers in all profiles needed to develop their knowledge, skills, and competencies and update themselves as a digital natives who could easily adapt to societal and social changes experienced in the 21st century.

The primary school teachers’ views for the effect of the innovative approaches in digital culture on the learning and teaching process

The primary school teachers’ views for the effects of the innovative approaches in digital culture upon the learning and teaching process were categorized by the digital profiles of the participants. The findings from the different teachers with different profiles were presented. One of the main reasons for the alienation of digital immigrant teachers from digital culture was that they did not
consider themselves capable and were reluctant to receive training on this subject. A digital immigrant teacher expressed her opinions concerning the above account as in the following:

T2: I am in favor of traditional education, and I do not like to use technology. Obviously, I do not find myself sufficient in technology, but I do not think I fail to keep up with my students (T2).

Although digital hybrid teachers confirmed that innovative approaches were effective and positively affected children, they indicated that they preferred similar educational websites and platforms instead of using innovative approaches such as Web 2.0 tools, coding, and STEM due to some technical deficiencies. For example, a digital hybrid teacher stated his opinions as in the following:

T7: Since we don't have a smartboard, I can't say that we use web tools a lot. We are diversifying the course as much as possible by using projectors, computers, and the internet (T7).

Digital native teachers stated that traditional methods no longer addressed children, innovative approaches and digital activities in digital culture were appealing to students, and they made a difference in the teaching and learning process. For example, one digital native teacher criticized the workload of using technological activities in a class by stating that he used different web tools and applications, but it was very time-consuming and challenging to prepare them for each class, so he preferred ready and easy-to-use applications more. Similarly, another digital native teacher expressed his ideas about the above issue as follows:

T1: Using digital tools adds a difference to the teaching and learning process. When we integrate even the simplest EIN (Educational Informatics Network) in the class, the interest and participation of the students increase, and the class is more fun (T1).

Even though digital immigrant teachers who noted that they incorporated digital tools and technology to only benefit from visuals and watch videos did not use innovative approaches in the learning and teaching process, they supported the practice of these approaches in primary school learning environments

**Primary school teachers' views on what they do and what to do to meet the learning needs of today's children in digital culture**

The views of the primary school teachers on what they did and what to do to meet the learning needs of today's children in digital culture were classified by the digital profiles of the participants. For example, one of the digital immigrant teachers stated that he did not make an effort to develop himself in terms of technology and digital culture by saying as in the following:

T1: I only use technology to benefit from visuals, so I do not need any education. I don't think I need to improve myself in terms of technology (T1).

Given the answers to the questions about what other digital immigrant teachers did to improve themselves, it would be meaningful to say that they made no extra effort on participating in seminars and in-service training organized by the Ministry of National Education (MoNE) behalf of technology.

Digital hybrid teachers stated that they participated only in in-service training activities for personal and professional development. Some digital hybrid teachers stated that they participated in different voluntary training programs besides in-service training activities organized by the MoNe. One of the digital hybrid teachers expressed his experience about the voluntary training programs as follows:
T4: I closely follow technological developments and participate in in-service training. Furthermore, I volunteer in different training activities and renew my knowledge. I'm currently trying to learn to code, and I'll try to teach children when I am done (T4).

In addition to digital native teachers who found in-service training activities adequate for their personal and professional development, some digital native teachers participated in different voluntary training activities besides in-service training activities offered by the MoNE. Moreover, they provided training themselves in the courses run by the MoNE about digital tools and web tools and improved themselves by taking further online training.

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

The research results reveal that the majority of participating teachers have a digital hybrid profile, who both adopt the use of digital tools and cannot give up traditional methods. This finding supports Yildiz-Kakirman (2012) work, who argues that individuals in digital culture cannot be separated as digital natives and digital immigrants sharply and proposes the definition of “digital hybrid.” Contrary to Prenksy (2001), who names the generation born in 1980 and after as digital natives and the generation born before 1980 as digital immigrants, it is concluded from the research findings that there may be digital native teachers born before 1980 and digital immigrant teachers born after 1980. In this case, it can be claimed that the digital profiles of individuals in digital culture cannot be determined by considering only the age variable. Also, Kennedy et al. (2008) suggest that it is not appropriate to simply distinguish digital natives by age, even if they were born after 1980.

While primary school teachers demonstrate the digital hybrid feature by using both printed and digital materials to organize learning environments, they are digital immigrants in communicating with parents and students. Martin (2011) examines the differences in technology usage of the digital native and digital immigrant primary school teachers in teaching practices and finds out that there are more similarities than differences between the two groups. Isik (2007) states that teachers and parents’ most preferred communication methods are face-to-face meetings, parents’ meetings, and phone calls. However, the finding revealed by Thompson (2008) in his study shows that teachers prefer to communicate with parents via e-mail, which contradicts the research finding. Therefore, it is concluded that primary school teachers display digital hybrid characteristics in providing their personal and professional development. While this result corroborates with Sad & Donmus (2017) findings, it contradicts the findings of Varis (2008), who found out that they use digital tools more for personal and professional development.

Upon examining the opinions of the primary school teachers about the concept of “digital culture,” it is found that teachers in all digital profiles have basic knowledge about digital culture. In contrast, digital immigrant teachers generally limit the digital culture to the words “computer” and “internet.” Furthermore, digital hybrid teachers define digital culture using similar expressions with digital immigrant teachers, while digital native teachers have better command of the components of digital culture than the teachers in the other profiles. This result reveals that the quantitative results of the research support the qualitative results that provide in-depth information through interviews.

According to the teachers’ opinions in all three profiles regarding their competency of digital culture, the teachers state that the young primary school teachers always try to be more active in using technology and digital tools in their classes. But they also indicate that teachers over a certain age are reluctant to use digital tools in education. The research results conducted by Guo, Dobson & Petrina (2008) show that there is no gap among teachers with different digital profile levels as expected. However, teachers exhibit digital competencies at different levels in the teaching process.

The studies conducted to determine the level of the digital divide between digital native students and digital immigrant teachers reveal that there is no division to the extent mentioned in the literature (Salajan, Schönwetter & Cleghorn, 2010; Waycott et al., 2010; Tešić, 2016). In addition to
digital immigrant teachers, all new millennium teachers have to learn to communicate in the language and style of their digital native students (Oriji & Torunarigha, 2019).

To conclude, meeting the challenges to ing digital technology requires a change in teacher training. This issue also involves changing the teacher’s professional development practices to become suitable with digital native’s expectations. For future research, primary school teachers’ digital competencies and perceptions of digital culture before and after COVID-19 can be compared.

REFERENCES


Isik, H. (2007). *Study of parent-school collaboration activities which are implemented in preschool education institutions on the base of parent opinions* (Master dissertation), Anadolu University, Eskisehir.


Varis, Z. (2008). *The level of information technology literacy and utilization of these technologies by the teachers in elementary schools* (Master dissertation), Gazi University, Ankara.


Reformative Shift on Initial Teacher Education in Turkey: From Authority to Autonomy

Semra Tican Başaran
Muğla Sıtkı Koçman University

Bilge Aslan Altan
Muğla Sıtkı Koçman University

Kerim Gündoğdu
Adnan Menderes University

Abstract

The purpose of the current study is to reveal the opinions and recommendations of the instructors in the field of Curriculum and Instruction regarding the recent reformative shift on initial teacher education in Turkey that is the decision of Turkish Higher Education Council to delegate the authority in developing and updating initial teacher education programs to the teacher education institutions. It is built on the survey design. The participants of the study are the 88 curriculum and instruction specialists from 37 universities in Turkey. The data were collected with an online questionnaire. Results of the study showed that, while the instructors welcome the decision of the Higher Education Council to delegate authority so that autonomy can be given to teacher education institutions within the general framework it has drawn and original contents can be developed, they have concerns that a minimum standard for teacher competencies cannot be achieved through initial teacher education programs with different qualifications. In order to ensure the development and sustainability of authentic initial teacher education programs in the new term, they recommend that the processes be carried out as participatory and transparent as possible, and that curriculum and instruction specialists and departments take an active role as a guide in this journey.

Keywords: Teacher Education, Initial Teacher Education, Initial Teacher Education Programs, Teacher Education Reform, Curriculum and Instruction Specialist.

DOI: 10.29329/ijpe.2022.426.23
INTRODUCTION

Today, the importance of teacher quality is well known (Goe, 2007) not only for student success (Barber & Mourshed, 2007), but correspondingly also for a good economy (Hanushek, 2011) and a good life (Chetty, et al., 2014). Training qualified teachers for a qualified education has become the main theme of education policies (Buchberger et al., 2000). Successful education systems spend most of their energies on teachers’ professional development, including initial teacher education (ITE) (Barber & Mourshed, 2007).

ITE is a dynamic process consisting of various components that affect each other, such as programs, integration of technology, faculty-school cooperation, and performance evaluation (Darling-Hammond & Bransford, 2005). Studies examining qualified teacher education systems have revealed that the most distinctive components of these systems are qualified ITE programs (Darling-Hammond, 2000; Çağatay, 2016; Özcan, 2012) and institutional capacities that make it possible to implement these programs (Darling-Hammond & Bransford, 2005). For this reason, among the studies on teacher education, program-centred studies are on the agenda in every period (Yıldırım, 2013). Accordingly, the criticisms levelled to teacher education systems, which form the basis of education reforms, are mostly directed towards the programs (Yıldırım, 2011).

With the National Education Basic Law (1973, Part 3, Article 43), defining teaching as a “profession of specialization”, it requires that “all pre-service teachers should receive higher education” with the construction of a framework including general culture, content knowledge and pedagogical knowledge”, which are the basic components of the profession. In the ongoing process, the ITE programs were organized to give a bachelor’s degree after a four-year education for all the fields of teaching (Kavak et al., 2007) and thus the foundation of the today’s teacher education system was set up.

Official reform movements were initiated in teacher education of Turkey, both at the structural and curricular level, in order to eliminate the problems that were the source of criticism and to meet the need for teachers in some fields (Erdem, 2013). While education faculties were restructured on the basis of department and programs through structural reforms, ITE were updated through program-level reforms (Grossman et al., 2007). With the new regulations, all education faculties started to follow the central standard programs developed by Higher Education Council (Yükseköğretim Kurulu [YÖK/HEC]) (Kavcar, 2002). Although central programs were initially welcomed with the conviction that they could prevent quality differences between education faculties, they later turned into a disadvantage due to the lack of flexibility in faculties, which caused the perception of a “standard program” to turn into the perception of a “fixed program”.

Continued experiences showed that reforms still had areas for improvement (Simsek & Yıldırım, 2001). In the theory-practice balance, which was disrupted in favor of practice with previous reforms (Üstüner, 2004), a new balance was sought this time with preferences in favor of theory. The theoretical lessons that were abolished before were placed in ITE programs again with the new reform (Karaca, 2008). The main reasons for these regulations are explained by HEC (2006) as follows; the failure of education faculties to equip teachers with the knowledge and skills required by the age and the restructuring initiatives by the Turkish Ministry of National Education, [Milli Eğitim Bakanlığı (MoNE)] including the paradigm change in primary education programs and implementing programs suitable for the learning outcomes determined by the European Higher Education for ITE.

In the following period, the updating of the General Competencies of the Teaching Profession in line with the Framework of Competencies in the European Higher Education (MoNE, 2017) and the European Commission’s recommendations for the creation of core programs for ITE and including at least 25.00% of elective courses in the programs triggered a new reform (HEC, 2018). The reasons for the update include training pre-service teachers as versatile and investigative teachers by gathering elective courses with similar content in a common pool, and the re-creation of the program in such a
way as to make content and pedagogy courses dominant in the program in parallel with the developments in the national K-12 curricula and educational sciences (HEC, 2018).

Today, Turkey has come to a new crossroad of reform with the announcement of HEC (2020) that the studies on the development and updating of the ITE programs of the faculties of education/educational sciences would be conducted by the concerned faculties considering the published competencies by official institutions (MoNE, 2017; Turkish Vocational Qualifications Authority, 2015). The HEC will undertake the tasks of monitoring, evaluating and supervising the process. Although the delegation of authority is promising for teacher education with creative and original models, the question of how the transition from a centralized teacher education model to authentic teacher education models will be is still ignored.

The conduct of education policies as planned depends to a great extent on how they are perceived by stakeholders (Aksit, 2007). The success of implementing any reform in the education system largely depends on the engagement (Fullan, 2001) and commitment (McLaughlin, 1987) of key stakeholders at all levels. Perhaps the most important stakeholders in reforms related to education programs are Curriculum and Instruction (C&I) specialists. However, researchers’ observations argue that the instructors are not sufficiently capitalized on as specialists in this field. It is fair to say that the scrutiny of how C&I specialists evaluate the serious decision of delegating authority by the Council of Higher Education, their views on the benefits and possible negative effects of this decision on teacher education process and their recommendations on how to manage the following processes may shed light on the sustainability of the reform and thus on the future of teacher education.

In this regard, the purpose of the current study is to reveal the opinions of C&I specialists (teacher educators at the same time) about the recent reformatory shift on initial teacher education in Turkey that is the decision of HEC on faculty-autonomy in developing and updating ITE programs, and their complementary recommendations for the forthcoming processes of teacher education. To this end, answers to the following questions were sought:

1. What are the opinions of the C&I specialists on the HEC’s decision of the delegation of authority of the development and updating of the ITE programs to the faculties of education/educational sciences?

2. What are the recommendations of the C&I specialists for the transition to the new period of authentic programs and its sustainability?

3. What are the opinions and recommendations of the C&I specialists in relation to possible responsibilities of C&I departments during and after the transition to the new period of authentic programs?

METHOD

The current study, which aims to reveal the opinions and recommendations of the C&I specialists about faculty-autonomy in ITE programs, is built on the cross-sectional survey design (Wiersma, 1991). Surveys aims to measure the variables like opinions, attitudes, recommendations etc. in the natural settings (Karasar, 2012;). Surveys mainly deals with the research question of what is/are and attempts to explain what is/are (Wiersma, 1991). In this line, this study basically attempted to explain what the opinions and recommendations of C&I specialists on the HEC’s decision of the delegation of authority of the development and updating of the ITE programs to the faculties of education/educational sciences are.

Participants of the Study

In the selection of the participants, the criterion sampling method was used. The criterion taken into consideration was being a specialist in the field of curriculum and instruction. All the 385
instructors who are members of the Turkish Association of Curriculum and Instruction (EPÖDER) were reached via e-mail, and 88 of them accepted to participate in the study voluntarily. Information about the participants is given in Table 1.

Table 1. Information about the Participants

<table>
<thead>
<tr>
<th>Institution</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muğla Sıtkı Koçman University</td>
<td>9.00</td>
<td>10.20</td>
</tr>
<tr>
<td>Aydın Adnan Menderes University</td>
<td>6.00</td>
<td>6.80</td>
</tr>
<tr>
<td>Anadolu University</td>
<td>5.00</td>
<td>5.70</td>
</tr>
<tr>
<td>Middle East Technical University</td>
<td>4.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Ankara University</td>
<td>4.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Ordu University</td>
<td>4.00</td>
<td>4.50</td>
</tr>
<tr>
<td>İnönü University</td>
<td>3.00</td>
<td>3.40</td>
</tr>
<tr>
<td>Pamukkale University</td>
<td>3.00</td>
<td>3.40</td>
</tr>
<tr>
<td>Ege University</td>
<td>3.00</td>
<td>3.40</td>
</tr>
<tr>
<td>Çukurova University</td>
<td>3.00</td>
<td>3.40</td>
</tr>
<tr>
<td>Foundation Universities</td>
<td>2.00</td>
<td>2.40</td>
</tr>
<tr>
<td>Retired</td>
<td>1.00</td>
<td>1.20</td>
</tr>
<tr>
<td>Other State Universities</td>
<td>41.00</td>
<td>46.60</td>
</tr>
<tr>
<td>Total</td>
<td>88.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>25.00</td>
<td>28.40</td>
</tr>
<tr>
<td>Assoc. Professor</td>
<td>33.00</td>
<td>37.50</td>
</tr>
<tr>
<td>Ass. Professor</td>
<td>22.00</td>
<td>25.00</td>
</tr>
<tr>
<td>Dr.</td>
<td>6.00</td>
<td>6.80</td>
</tr>
<tr>
<td>Research assistant (doctoral studies are still in progress)</td>
<td>2.00</td>
<td>2.20</td>
</tr>
<tr>
<td>Total</td>
<td>88.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of Service</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>7.00</td>
<td>7.95</td>
</tr>
<tr>
<td>6-10 years</td>
<td>15.00</td>
<td>17.04</td>
</tr>
<tr>
<td>11-15 years</td>
<td>13.00</td>
<td>14.77</td>
</tr>
<tr>
<td>16-20 years</td>
<td>16.00</td>
<td>18.18</td>
</tr>
<tr>
<td>20 years and more</td>
<td>37.00</td>
<td>42.04</td>
</tr>
<tr>
<td>Total</td>
<td>88.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Administrative Duty</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean/Deputy Dean</td>
<td>6.00</td>
<td>6.90</td>
</tr>
<tr>
<td>Institute Director/Assistant Director</td>
<td>1.00</td>
<td>1.10</td>
</tr>
<tr>
<td>Head of Department/Vice President</td>
<td>16.00</td>
<td>18.40</td>
</tr>
<tr>
<td>Head of a program</td>
<td>18.00</td>
<td>20.70</td>
</tr>
<tr>
<td>Others</td>
<td>8.00</td>
<td>7.80</td>
</tr>
<tr>
<td>No administrative duty</td>
<td>50.00</td>
<td>57.30</td>
</tr>
<tr>
<td>Total</td>
<td>88.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The study group consisted of academicians from 37 different universities and most of them are females (54.50%), associate professors and professors (65.90%), have been working for 11 years or more (74.99%) and have no administrative duties (57.30%). The experiences of participants, who are expected to take part in the development, review and/or evaluation processes of teacher education in line with the new decision, regarding program development and/or evaluation, are important. For this reason, they were asked whether they were involved in any program development/evaluation studies. The findings showed that the majority of the instructors have experience in scientific studies (57.00%) or in the development/evaluation processes of various programs such as ITE (14.00%), but 10.50% of them have not yet been involved in any program development/evaluation process.

Data Collection and Data Collection Instrument

In survey studies, the questionnaire is one of the main data collection tools, and it may comprise open and close-ended questions depending on the purpose of the study (Karasar, 2012; Wiersma, 1991). In this line the data were collected with a questionnaire consisting of open and close-ended questions prepared by the researchers. While developing the questionnaire first, the draft questionnaire was developed on the basis of literature and experiences of the researchers. Then, the
opinions and recommendations of five specialists in the field of curriculum and instruction, measurement and evaluation and teacher education in two universities the researchers are studying, were taken. In line with the recommendations from the specialists reviewed questionnaire piloted with five C&I specialists, then it finalized. In the first part of the questionnaire, there are 5 close-ended questions eliciting the demographic information of the participants; in the second part, 4 close-ended questions about how the information about the delegation of authority was obtained, the state of dissemination of this information throughout the faculty, the current studies carried out and the experiences gained during the program development/evaluation process, and in the last part, there are five open-ended questions collecting data about possible positive/negative scenarios that might have been experienced after the decision was taken, recommendations for the transition and subsequent processes and the responsibilities of C&I instructors. Thus, the questionnaire used as a data collection tool was constructed to be consisted of a total of 14 questions; nine close-ended and five open-ended. The electronic form of the questionnaire was sent to the e-mail addresses of the instructors via EPÖDER in the academic year of 2020-2021 spring semester.

Data Analysis

Descriptive statistics were used in the analysis of the responses to the close-ended questions. The demographic information in the first part of the questionnaire and the information in the second part are presented as frequency and percentage distributions. The responses to the other open-ended questions in the last part of the questionnaire were subjected to a two-stage inductive content analysis (Creswell, 2003). In the first stage, open coding and in the second stage, axis coding was performed (Gürbüz & Şahin, 2018). After the participants’ responses were read in the open coding process, meaningful codes were determined, and the related codes were brought together under the themes, to make junk of data more understandable. In the axis coding, considering the research questions, relationships between the codes under each theme or where appropriate, the relations with other codes within other themes and the relations among the themes were explained and interpreted. The themes and interpretations were supported with meaningful and remarkable quotations from the responses given by the participants.

Various measures were taken to establish validity and reliability in the study: During the development of the data collection tool, the analysis of the data and the process of making inferences from the results, the opinions of C&I, qualitative research methods and language experts were collaborated. A pilot application of the questionnaire was made with two instructors who are specialists in the field of C&I. The responses given by three randomly selected participants to the open questions were coded by two researchers, and the coding was continued until reaching a consensus on the issues of disagreement. Confirmation of two instructors was sought whether the codes, themes and interpretations obtained represented the data set. In order to increase objectivity and provide the possibility of comparison, the findings are presented with their numerical values. Finally, the findings of the study were supported with direct quotations from the participants coded as P1, P2, … P88 for ethical issues.

Participation in the study was on a voluntary basis and no information that violates personal privacy was requested. In addition, ethics committee approval was obtained for the study from the Social and Human Sciences Research Ethics Committee of first author’s University on February 03, 2021 with the decision numbered 50.

FINDINGS

In this section, the findings obtained in the study are presented. In this context, first the findings related to preliminary information and then the findings related to the research questions are presented. The findings regarding the channels of the participants through which they have heard about the decision of the delegation of authority are summarized in Table 2.
The Findings Regarding the Preliminary Information

The findings regarding the channels of the participants through which they have heard about the decision of the delegation of authority are summarized in Table 2.

Table 2. Channels of the Participants Through Which They Have Heard About the Decision of the Delegation of Authority

<table>
<thead>
<tr>
<th>Channels through which they heard</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through a message sent by HEC to my institutional e-mail address</td>
<td>40.00</td>
<td>45.50</td>
</tr>
<tr>
<td>Through the HEC’s institutional website</td>
<td>14.00</td>
<td>15.90</td>
</tr>
<tr>
<td>Through the Dean’s message on the subject</td>
<td>23.00</td>
<td>26.10</td>
</tr>
<tr>
<td>Through the message sent by the head of the department on the subject</td>
<td>9.00</td>
<td>10.20</td>
</tr>
<tr>
<td>Through the message sent by the head of the program on the subject</td>
<td>3.00</td>
<td>3.40</td>
</tr>
<tr>
<td>Through my colleagues</td>
<td>19.00</td>
<td>21.60</td>
</tr>
<tr>
<td>Through media</td>
<td>29.00</td>
<td>33.30</td>
</tr>
<tr>
<td>Through social media</td>
<td>17.00</td>
<td>19.30</td>
</tr>
<tr>
<td>Through the official letter sent by HEC to faculties</td>
<td>1.00</td>
<td>1.10</td>
</tr>
<tr>
<td>Not heard</td>
<td>2.00</td>
<td>2.30</td>
</tr>
<tr>
<td>Total</td>
<td>88.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

As can be seen in Table 2, a significant part of the participants was informed about the delegation of authority mainly through the message sent by HEC to their institutional e-mail addresses (45.50%), media (33.30%) and the Dean’s message (26.10%). Despite variety of channels to inform them, there are also instructors (2.30%) who haven’t heard about this decision yet.

The responses given by the participants about the extent to which they themselves and other faculty members in their faculties have heard about this decision are summarized in Table 3.

Table 3. State of Faculty Members’ Having Heard About HEC’s Decision of the Delegation of Authority

<table>
<thead>
<tr>
<th>State of faculty members’ having heard</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>All the faculty members have heard about it</td>
<td>35.00</td>
<td>39.80</td>
</tr>
<tr>
<td>The great majority of the faculty members have heard about it</td>
<td>29.00</td>
<td>33.00</td>
</tr>
<tr>
<td>Some of the faculty members have heard about it</td>
<td>11.00</td>
<td>12.50</td>
</tr>
<tr>
<td>I have no idea about the subject</td>
<td>13.00</td>
<td>14.80</td>
</tr>
<tr>
<td>None of them have heard about it</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>88.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

From Table 3, it is understood that the faculty members participating in the study are generally aware of HEC’s decision of the delegation of authority (39.80% and 33.00%).

The findings regarding the studies initiated and/or completed in faculties after the relevant decision was taken are given in Table 4.

Table 4. State of the Studies on ITE Programs in Faculties

<table>
<thead>
<tr>
<th>State of the studies on ITE programs in faculties</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITE programs for the new term have been prepared in all the departments</td>
<td>4.00</td>
<td>4.50</td>
</tr>
<tr>
<td>ITE programs for the new term have been prepared in some departments</td>
<td>2.00</td>
<td>2.30</td>
</tr>
<tr>
<td>Studies have been initiated to develop ITE programs in all the departments</td>
<td>16.00</td>
<td>18.20</td>
</tr>
<tr>
<td>Studies have been initiated to develop ITE programs in some departments</td>
<td>23.00</td>
<td>26.10</td>
</tr>
<tr>
<td>Studies have been initiated to develop ITE programs in none of the departments</td>
<td>30.00</td>
<td>33.00</td>
</tr>
<tr>
<td>I have no idea on the subject</td>
<td>13.00</td>
<td>14.80</td>
</tr>
<tr>
<td>Total</td>
<td>88.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

In Table 4, it is seen that some faculties have not started any studies on their ITE programs yet, whereas in a limited number of faculties, all departments or some departments have prepared their ITE programs for the new term. On the other hand, in some faculties studies have been started in some
or all the departments to prepare ITE programs for the new term. A significant number of instructors have no idea about the studies carried out on ITE programs in their faculties.

**Findings Regarding the Research Questions**

The results of the content analysis of the qualitative data obtained from the open-ended questions are summarized in Figure 1.

Figure 1 shows that, the analysis of the C&I specialists’ opinions and recommendations regarding HEC’s Decision of the Delegation of Authority yielded the five main themes. As follows, each main theme is presented separately.

**The Findings Regarding the Opinions of the C&I Specialists on the Delegation of the Authority.**

The findings regarding the opinions of the C&I specialists on the delegation of the authority are grouped under the titles of potential positive and negative sides of the decision of the delegation of authority.

**The Findings of Potential Positive Sides of Delegation of Authority.** The opinions of the participants on the potential positive sides of autonomy in developing ITE programs as a result of the decision of the delegation of authority are basically gathered under two main themes presented in Figure 2: faculty autonomy (f=64.00) and content (f=29.00).
In Figure 2 it is seen that, the participants placed the greatest emphasis on gaining faculty autonomy and the practices that this autonomy can bring as a potential positive side of the new decision. Under the theme of faculty autonomy, participant responses focused on the themes of local/regional originality, needs-oriented program studies, institutional development and competitiveness in quality. When examined in more detail, it is seen that the potential positive side often emphasized in faculty autonomy is local/regional authenticity. The participants stated that after shifting autonomy, faculties can make original plans and practices considering different dynamics such as their own human and physical resources, local and regional collaborations, student profile and that program implementations can gain flexibility and these can be seen as the potential positive sides of the decision. The responses given by the participants within the scope of local/regional authenticity are exemplified below:

“It will bring autonomy and flexibility to faculties.” (P29)

“I think that developing their own original programs by making program development studies in faculties can contribute to the creation of models and structures that are tailored to the needs, original and suitable for the institutional background of the faculties. Thus, faculty-specific structures and processes will be developed.” (P47)

“Delegation of authority to education faculties can enable them to prepare appropriate programs within the context of their region.” (P53)

Another possible positive effect that the participants care about within the scope of practices that can be conducted within faculty autonomy is that the program studies within the faculty can be carried out in line with the needs felt and identified. Some of the participants think that a need-oriented and multilateral participation-based understanding of the processes will make the curriculum development processes more democratic, as well as strengthen the democratization of the internal functioning of the faculty. It was emphasized as an important part of these studies that faculties could determine their program preferences in line with the varying professional needs of pre-service teachers. The responses given by the participants are exemplified below:

“The reduction of intensive central control in teacher training processes and the better meeting of local needs contribute to the democratization of the departments and to the faculty democratization processes and programs.” (P4)
“If it is managed to be objective, it can be useful and if professional needs and professional development, current scientific and technological developments are taken into account, then it can be really useful.” (P11)

Another issue that the participants focused on among the potential positive sides is the institutional development of faculties. The contributions of the autonomous program studies and cooperative and institutional improvements to the institutional identity of faculties and the institutional belongingness of faculty staff are seen among the potential positive sides. The responses given by the participants within the context of supporting institutional development are exemplified below:

“It is a positive development that innovative universities with an academic tradition and institutional identity design and develop their own programs.” (P5)

“This is a delayed decision. I think it paves the way for education faculties to mature, find their identity and institutionalize...” (P20)

“I find it positive in terms of the participation of all stakeholders in program development studies. I think that it can strengthen the sense of commitment and cooperation.” (P75)

Within the framework of faculty autonomy, the participants are of the opinion that the original ITE of faculties can create a competitive environment in increasing the quality at the national level and this competition will support change and development in a positive direction. It is also among the positive sides that different studies and practices could be an example and guide for faculties. In this regard, one participant expressed his/her opinions as follows:

“It can create a positive competitive environment for the emergence of better ITE programs.” (P20)

In addition to the positive developments that can occur within the context of faculty autonomy, there are some positive developments that the participants think can be achieved within the context of content. In the main theme of content, the themes of content revision, making use of the expertise of instructors and updated vision were mentioned.

When the content revision is examined in itself, it is seen that the variety of the courses and their content’s being able to meet the needs are the potential positive sides emphasized by the participants. Conducting studies to increase the diversity of the courses, to include up-to-date course contents in the program and to compensate for the weaknesses of the existing programs was also emphasized within the theme of content revision. The participants’ responses are exemplified below:

“More up-to-date courses can be included in the program. Elective courses can be chosen according to need. Maybe the number of practical courses can be increased.” (P36)

“Objectives can be created to include knowledge, skills and competences that are not included in current programs and courses can be added accordingly. Levels of existing courses can be adjusted... Decreased credits of pedagogical content knowledge courses can be increased.” (P54)

In connection with the revisions that can be made in course contents, the benefits that can be obtained from the expertise of instructors in the presentation of new and rich contents were also shown among the potential positive sides. According to the participants, instructors working in different faculties will be able to positively affect these studies by taking an active role in determining course contents and types compatible with their fields of expertise. The participants’ responses are exemplified below:

“With the delegation of authority, the courses can be diversified according to the expertise of the faculty members.” (P31)
“It will allow the inclusion of the courses that will enable academic staff to make more effective use of their expertise, experience and competences in the program.” (P40)

Based on the participant responses, the last possible positive effect considered within the theme of content is the updating of the vision in the content design. In the sub-theme of updated vision, the participants emphasized that the values, principles and processes that are considered nationally and internationally important should be taken into account in the content selection and organization of the teacher training program studies to be carried out under faculty autonomy, and stated that the vision should be updated in this direction. In this regard, some opinions of the participants are given below:

“It is positive. When the flexibility in the understanding of curriculum development is considered, each institution should consider various factors such as the region where it is located, developments in science and technology and individual differences.” (P17)

“Programs that can keep up with the development of science and technology and focus on developing analytical thinking, critical thinking and problem-solving skills can be prepared.” (P33)

The Findings of Potential Negative Sides of Delegation of Authority.

The findings of potential negative sides of delegation of authority are presented in Figure 3.

Figure 3. Opinions of the C&I Specialists Regarding Potential Negative Sides of HEC’s Decision of the Delegation of Authority

Figure 3 shows that, the main focus of the participants’ responses regarding the potential negative sides of applying authentic programs after the decision of the delegation of authority is quality (f=70.00) and standardization (f=37.00). The two main issues that are thought to have negative effects on the quality of ITE as a result of the decision of the delegation of authority are the effects of content/pedagogical content knowledge experts and the differences in content/course selection. The potential negative sides related to standardization were identified as differences between graduates and accreditation problems.

In the sub-theme of the effects of content and pedagogical knowledge specialists working in the faculty on the development of qualified ITE within the context of faculty autonomy, concerns about potential problems such as the failure of the academic staff of both groups to cooperate, the opening of arbitrary courses, the precedence of content knowledge courses to pedagogy courses, the inability to ensure the active participation of all instructors in the process, dominance of some group on the decisions taken and attaching greater importance to political or personal interests than the goals of training qualified teachers were strongly emphasized. In addition to human differences, the participants also drew attention to the possible negative effects of differences in experience and
academic competence of the curriculum development process. It was emphasized that the quality differences of the academic staff that may be encountered in the process in terms of thought and experience will create diversity in the standards and quality of the program to be developed. In this regard, some participants expressed their opinions as follows:

“The people who will develop the program (whether teachers or instructors) must first of all have program development skills. However, given that many faculty members in education faculties do not even have formation education, it can be said that it is a dream to expect efficiency from the programs they will prepare. On the contrary, it may cause harm, not benefit, to pre-service teachers.” (P21)

“When faculties prepare their own programs, the programs preferred by the dominant groups/fields in the faculties will be prepared ….” (P5)

“If political ideologies and personal interests are given priority in the program preparation process, many negative aspects may emerge. I have concerns.” (P50)

“I also see the possibility that programs can be created in a very unethical way due to personal interests within faculties as a negative aspect.” (P65)

Other possible negative aspects that make the participants feel concerned about authentic programs are related to the courses and contents to be determined in the process. In the sub-theme of content/course selection differences, the participants drew attention to the potential of differences that might occur among faculties in many aspects such as course selection, number of courses and credits of courses, the expertise of instructors, content organization and physical environment to negatively affect the quality of ITE. Examples of responses reflecting the participants’ concerns are given below:

“Since the course content and credits will be determined by the institution authorities, the courses that are deemed highly necessary for the teaching profession may be replaced by other courses.” (P6)

“In a situation where consistency between universities cannot be achieved… the quality gap between universities may increase even more.” (P8)

“The lack of standards in the courses and their content can make it difficult to assess the teaching competences of pre-service teachers across the country.” (P66)

“I think that the quality of education will decrease, especially in universities that cannot be institutionalized, have insufficient teaching staff, and have insufficient physical facilities and research resources.” (P72)

In connection with quality, under the theme of standardization, the primary concern of the participants about the possible negative aspects of the delegation of authority is that pre-service teachers graduate from different faculty programs with different qualifications. Graduates, who may vary in terms of teacher competencies and program standards, can be negatively affected if each faculty of education implements its own unique teacher training program. In particular, the fact that all pre-service teachers must have standardized exams in order to be appointed further strengthened this concern of the participants. Examples of the responses given by the participants are given below:

“Differences may occur in the qualifications of graduates, existing differences may deepen.”(P25)

“The fact that the programs developed by each faculty focus on different competences, but the graduates will serve the same system can make a difference in terms of competences.” (P26)
“Centralization of assessment and evaluation may be disadvantageous for pre-service teachers when the programs are decentralized. Nevertheless, a core teacher training program can be determined and pre-service teachers can be held responsible for this program. Maybe another alternative or even alternatives can be considered for the exam ...” (P12)

Another issue emphasized by the participants within the context of standardization was the accreditation issue, which is required for transfers among universities. According to the participants, the different course and content organization determined by each faculty within the scope of its own program may adversely affect the accreditation in inter-university transfers. The responses of the participants in relation to accreditation are exemplified below:

“There may be compatibility problems between programs in student movements such as Farabi, double major, minor, lateral transfers.” (P62)

“...In addition, when you change a course, the course accreditation of students coming from other education faculties with lateral transfer etc. becomes a big problem.” (P17)

Findings Regarding Recommendations of C&I Specialists for the Transition Process to the New Period of Authentic Programs

The recommendations of the participants are presented under the titles of transition to and the sustainability of the new term of authentic programs.

Findings Regarding Recommendations of C&I Specialists for the Transition Process to the New Period of Authentic Programs. Findings regarding recommendations of C&I specialists for the transition process to the new period of authentic programs are presented in Figure 4.

Figure 4. Recommendations of the C&I Specialists for the Transition Process to the New Period of Authentic Programs

Figure 4 shows that, after the decision of the delegation of authority, four main themes emerged from the recommendations received from the participants regarding the process of transition to the period of planning and implementing their own ITE programs by education faculties. According to the participants, during the process of transition to the new period, the establishment of independent program development units/commissions (f=30.00), the development of a core program with shared standards (f=23.00), the completion of basic infrastructure and preparations (f=18.00) and ensuring cooperation between the faculty and personnel (f=12.00) are the most important issues. It was noted that with these recommendations, negative effects can be prevented.
The most important recommendation made by the participants seems to be the establishment of independent program development units/commissions in order to plan, implement and supervise the ITE in the faculties in accordance with a scientific and systematic process. It was considered important to include program development experts in the commissions to be established. It was emphasized that the theoretical structure and operation, which is the basis of program development studies, can be carried out in a scientific framework independently in these commissions. Examples of the responses from the participants are given below:

“Commissions should be established for the evaluation and development of ITE programs in faculties. In particular, these commissions should include faculty members who hold a doctoral degree in the field of curriculum and measurement-evaluation. In this way, ITE programs should be evaluated and developed.” (P31)

“Establishment of the “Program Development Team”, which includes academicians working in this field, under the roof of each Department, as well as the creation of the “Program Development Unit” of the Faculty, which will ensure coordination between ITE programs.” (P40)

“A higher commission should be established at the faculty level and then program development commissions should be established separately for each department including all the stakeholders, needs analysis should be conducted, program objectives/outcomes should be determined based on stakeholders’ opinions and needs analysis, and courses should be determined accordingly.” (P50)

“Plans can be made with the coordination of the Educational Sciences Department. It may be beneficial to establish units composed of competent people in the field of education to inspect whether qualified programs have been created, and to make evaluations in accordance with the criteria presented by HEC.” (P54)

It was recommended that besides independent units and commissions, a basic core program framework could be created in faculties in order to prevent problems that might be experienced in standardization. They stated that in this way unity could be achieved in basic teacher competencies and standards, the problem of accreditation in student transfers between faculties could be resolved and pre-service teachers could gain the common knowledge required to be appointed as a teacher. The responses given by the participants are exemplified below:

“Faculties should jointly prepare a program framework.” (P12)

“Although faculties are let free to develop their own programs, some common courses on the competences of the teaching profession must be given in every faculty. It would be beneficial to establish a higher committee to decide on these courses.” (P15)

“Within the framework of a core program, a flexible program consisting of elective courses should be created in which each department and faculty can reflect their own characteristics.” (P25)

“Working around a core program in the process, some policy decisions made by HEC and universities and managing it under the coordination of program development experts working in faculties.” (P74)

In the recommendations of the participants, the need to complete the basic infrastructure and preparations by taking into account the possible problems that might be encountered in the development of autonomous ITE programs was also emphasized. In this regard, the participants expressed their concerns about creating a framework for the qualifications and standards of the core program, reducing the differences between students graduating from different faculties and carrying
out the scientific program development process and emphasized the necessity of examining national and international literature and practices, creating national appointment criteria and supporting scientific meetings and conferences. They pointed out the need for planning to determine how to use time and human resources. Some sample responses of the participants are given below:

“I think it is necessary to carry out scientific research in cooperation with associations in the field of educational sciences and to create a data/knowledge base on teacher education. Cooperation can be established with HEC-Teacher Training Working Group and Association for Evaluation and Accreditation of Teacher Education Programs (Öğretmenlik Eğitim Programları Değerlendirme ve Akreditasyon Derneği [EPDAD]). An association that deals only with teacher education can be established and continuous research can be conducted on ITE programs.” (P20)

“Rather than deciding which courses to offer on the basis of the staff we have, an original model can be created by seeking answers to these questions “What kind of teacher do we want?”,” “What competences should our teachers have for now and in the future?” (P23)

“Preparing the theoretical infrastructure, preparing the physical and academic infrastructure and testing the program. Actually following a complete program development process. This is a process that takes time and patience. Therefore, at least 1 year should be allocated.” (P59)

Another recommendation of the participants regarding the efficient progression of this whole process is the establishment of cooperation between faculties and within faculties. While the faculties are planning their own ITE programs, it is considered very important to cooperate with other faculties and each faculty with their own departments:

“Education faculty deans can cooperate in the program development process ... Each faculty of education can carry out program studies in cooperation with their internal and external stakeholders.” (P72)

**Findings Regarding Recommendations of C&I Specialists for the Sustainability of the New Period of Authentic Programs.** Findings regarding recommendations of C&I specialists for the sustainability of the new period of authentic programs are presented in Figure 5.

When the recommendations for the sustainability of the planning and implementation period of teacher training institutions’ own ITE programs after the decision of the delegation of authority in Figure 5 were examined, it was seen that the majority of the participants (f=50.00) emphasized *continuity in systematic studies*. In addition to these studies, it was stated that *basic features should be added to the program structure* (f=12.00). Although there are different recommendations regarding the transition process, there are also participants (f=21.00) who think that this process is *not sustainable*.  

![Figure 5. Recommendations of the C&I Specialists for the Sustainability of the New Period of Authentic Programs](image-url)
Particularly emphasized in the sustainability of the planning and implementation period of authentic ITE programs of teacher education institutions, is the continuity of systematic follow-up studies. Within the scope of these studies, it was considered important to take steps such as establishing cooperation with different institutions and organizations and functional control mechanisms, making use of feedback and the program evaluation cycle, but there is no agreement among the participants on which institutions/persons would carry out the inspections. Examples of the participants’ responses are given below:

“A scientific committee should be established for the development, evaluation and revision of ITE programs at HEC and universities. In this process, accreditation works should be accelerated. Since it will be difficult for HEC to monitor all programs due to its central status, monitoring and accreditation works can be carried out regionally. Both national and international accreditation seems to be an important issue.” (P5)

“Evaluations should be made at specified intervals regarding the programs developed under the leadership of faculty administration and necessary revisions should be made in line with the evaluations.” (P41)

“Efforts should be made to increase the number of institutionalized independent associations that will accredit faculties. These associations should evaluate the competences of faculties every 2 years. Emphasis should be placed on efforts to improve the quality of postgraduate education programs in education faculties so that new academicians can be trained.” (P67)

Another issue that the participants drew attention to in terms of sustainability was the addition of basic features and standards to the program structure. The creation of guidelines and standards in a written or unwritten framework regarding the organization and evaluation criteria of the programs to be developed/having been developed is considered important in terms of sustainability. In this connection, there is an opinion as follows:

“In cases where it can be guaranteed that certain criteria and minimum standards are met, the sustainability of the program can be possible. Otherwise, it would be sustainable, but the issue of quality can lead to serious discussions.” (P54)

Although explicit statements were limited, based on the country’s history of rapid and frequent changes in education policies, the participants had some suspicions about the sustainability of the steps to be taken after the decision of the delegation of authority. In this regard, they expressed their opinions as follows:

“Since nothing is sustainable in our country, this new period will not be sustainable, either. As a result of unjustified, unfounded and arbitrary practices, it will be terminated.” (P29)

“Everything is done to save the day without meticulous long-term plans. Sustainability is impossible.” (P19)

“It will continue to be a problem in terms of sustainability as it is not an autonomous structure and the MoNE provides employment for newly graduated teachers.” (P25)

Findings of Possible Responsibilities of C&I Departments During and After the Transition to the New Period of Authentic Programs.

Findings of possible responsibilities of C&I departments during and after the transition to the new period of authentic programs are presented in Figure 6.
The recommendations of the participants regarding the responsibilities of C&I departments in the development of ITE programs in the new period were gathered under two main themes seen in Figure 6: department’s working as a coordination unit ($f=65.00$) and academic staff and institutional cooperation ($f=11.00$).

The participants seeing the C&I department as a unit of organization stated that the most basic authority should be in this department. They stated that this department should take important responsibilities in guiding every stage of the work to be carried out in the process, making job descriptions, organizing, determining the criteria, managing the evaluation processes and holding scientific meetings. The participants’ opinions are exemplified below:

“As C&I academics, we should take part in the management and coordination of this process. If we stay away or are kept away from the process, we will not be able to participate in the studies required by our field and we will not be able to fulfil our responsibility to train qualified teachers.” (P2)

“C&I is at the heart of this issue due to its area of expertise and is expected to play a key role…” (P29)

“I think they have the most fundamental role. They will be effective in making this process the most effective and sustainable by structuring the process, conducting the necessary research and sharing experiences through inter-institutional cooperation.” (P28)

In addition to their opinions on the responsibilities of C&I specialists, the participants stated that in order to ensure the efficiency of the process, C&I specialists should be involved in the cooperation processes and that they should also take part in the studies conducted by different departments to prepare their own programs. The recommendations of the participants are exemplified in the following excerpts:

“C&I specialists should lead the curriculum development process, work in cooperation with measurement and evaluation experts and field experts in this process, take responsibility for the curriculum development process and direct the programs.” (P47)

“Faculty members of C&I departments of different education faculties can cooperate for program studies and research in this process. EPÖDER can contribute to this.” (P72)

**DISCUSSION**

Teacher education is among Turkey’s primary education policies (MoNE, 2018). The undergoing reforms for ITE programs are important milestones in Turkey’s teacher education history. This very present decision to transfer the authority to education faculties to develop their own programs in 2020, we have arrived in a new crossroad of teacher education. Subsequently, in this study, opinions and recommendations of C&I instructors about the new policy and their own responsibilities in this process were valued.
The study group stated that they heard about the decision of the delegation of authority through e-mails sent by HEC, media, and the deans of faculties. Given the existence of a limited group who stated that they were not aware of the subject at the time the study data were collected, it can be said that more channels should be used to inform instructors on such issues. In addition, although it has been about a year since the announcement of the transfer of authority, more than half of the instructors stated that no department had started to develop their own ITE programs, and some of the instructors stated that in some of the departments, studies to develop their own programs had been started. While studies have been started in all departments in some faculties, it is understood that all departments of a limited number of education faculties and some departments of some faculties have their programs for the new term ready. In addition, one of Turkey’s long-established education faculties has completed its program development studies for all the departments and announced to all universities in an official letter that it can share its new programs with the education faculties in need or guide other faculties in the process of developing their own programs. This might indicate that education faculties are at different stages of the preparation process after the delegation of authority; while some are preparing for the role of guiding other faculties, some do not want to act hastily on this issue. In addition, this might indicate that education faculties need time to determine a roadmap on how they can develop their own programs in the new period. The fact that 129 ITE programs have been accredited within a period ranging from two to five years as of 2021 (EPDAD, 2021) and that they are waiting for the expiration of the accreditation period may also affect the process, which may be one of the reasons behind the failure of education faculties to act quickly.

The C&I specialists expressed the possible positive and negative effects of the new decision on the teacher education process. According to the them, the two main positive aspects of the decision are that it gives autonomy to faculties and correspondingly, more freedom in the selection of content. According to Güven (2015), it would not be wrong to say that the decision is perceived by C&I specialists as the return of the autonomy taken from teacher education institutions with the past reform initiated in 1997. The C&I specialists think that the given autonomy will have positive effects on education faculties in four main points:

**Local/regional authenticity:** In this context, education faculties will have the flexibility to develop and implement their own programs, taking into account their regional dynamics and opportunities such as physical and human resources, student profile, and their own internal, local and regional collaborations and thus they can be converted into entrepreneurial faculties that take charge of their own programs rather than being technician faculties in the position of the implementer of the central programs presented by HEC. At this point, the original programs to be developed by faculties have the potential to yield good examples that could not be presented in the literature (Yıldırım, 2013) because of the “fixed program” used in teacher education after the 1997 reform (HEC, 2007). On the other side, an important issue is that the decision should be understood well while developing authentic ITE programs. In the announcement, HEC defined its role for the new term as making high-level regulations, monitoring, evaluating and supervising the process after drawing the general framework on higher education issues. Therefore, when these explanations are taken into consideration, it is understood that education faculties can develop “original programs” to the extent permitted by the general framework and that concerns about quality differences will be tried to be resolved by HEC’s monitoring and inspections, however, no explanation has been received yet regarding the functioning of the process.

**Needs-oriented program studies:** The C&I specialists think that faculties will focus on the professional needs of pre-service teachers in order to develop original programs, and faculties that can understand well the opportunities of the faculty and the region they are located in can develop original programs. Some of the participants think that a need-oriented and multilateral participation-based understanding of the processes will make the curriculum development processes more democratic, as well as strengthen the democratization of the internal functioning of the faculty. Needs-oriented programs are also considered as selection criterion of students for the education faculty. Thus, education faculty student candidates will pursue their own teacher model and teaching ideals. It is a known fact that one of the dilemmas in teacher education in Turkey is the profile of pre-service
teachers who prefer teaching for reasons other than the ideals of the profession (Aksu et al., 2010; Tican-Başaran & Aksu, 2005).

Institutional development: The C&I specialists believe that the process of developing their own programs with the participation of the faculties’ stakeholders will strengthen their cooperation, their sense of commitment, and develop their institutional identity by creating the academic traditions of faculties. Therefore, it may be possible for education faculties to institutionalize in line with their own dynamics.

Competition in quality: According to the C&I specialists, the original ITE programs after the delegation of authority will not only increase the number of good practices, but also lead to a positive competition among education faculties in order to train better teachers, and this will positively affect the teacher quality. There will be a transformation from the understanding of training “technician teachers” (Guven, 2008) towards training “teachers who solve problems and teach learning” (HEC, 2007, p.10).

The C&I specialists predict that the decision of the delegation of authority may have positive effects on ITE in terms of content, and their predictions are grouped under three themes:

Content revision: The C&I specialists think that with the new decision, faculties of education can include courses that meet the needs in their programs. In this sense, they think that the limited number of class hours allocated to teaching practice courses can be increased, the number of elective courses can be increased, elective courses that are out of date or similar to each other can be removed from the program, more emphasis can be put on the interdisciplinary structure of the program and inadequacies related to inclusive education can be compensated. However, new programs to be created without relying on research findings will not differ from previous programs that have been subjected to criticism (Yıldırım, 2013).

Making use of the expertise of instructors: The C&I specialists think that while the teacher education institutions create their own programs in the new period, the content of the courses in the programs can be matched with the expertise of instructors, thus the efficiency of the program can be increased. Moreover, they think that the shortage of teaching staff to teach some courses at education faculties can be overcome and some expertise of instructors remaining idle in the central teaching training programs can be utilized more effectively (Özoğlu, 2010).

Updated vision: The C&I specialists think that they should act parallel with national and international standards during the development of their own programs, and so, it is necessary to start with a change in vision.

Although HEC (2020) points to the Turkish Competencies Framework and the MoNE’s (2017) General Competencies for the Teaching Profession in its decision, the general competencies and the framework have been changed over time. Therefore, it cannot be predicted to what extent teacher competencies, which are determined very generally for all teaching fields, will guide teacher education institutions in the process of developing their own programs. For this reason, it is clearly seen that there is a need for reliable references to guide teacher education institutions in this specific process.

It will not be difficult to create an innovative vision based on the results of existing research and with the expertise of 9023.00 faculty members working in 91.00 Education Faculties and 231.00 academic personnel working in four Faculties of Educational Sciences in the 2020-2021 academic year (HEC, 2021). However, although there are tried models (Erdem, 2015) and rich experiences (Saylan, 2013) regarding teacher education in the country, the research on them is limited (Yıldırım, 2013), investigation of the successful teacher education systems abroad (Barber & Moursheed, 2007; Darling-Hammond, 2010) will be inevitable. As our previous experiences show, rather than importing the models considered to be successful, it would be a rational choice to make use of these models by
adapting them to our own needs and goals (Kavcar, 2002), because in the information age where the competition among education systems is getting fiercer, there is no luxury to reach the truth by trial and error.

Overall, it can be said that the C&I specialists welcomed the decision of the delegation of authority in terms of providing the faculties with the opportunity to develop their own programs and accordingly to create and update the content on the basis of global and local needs.

On the other hand, the C&I specialists have concerns about some problems related to the new decision gathered under two main headings: quality and standardization. While the C&I specialists basically see the effects of content/pedagogical content knowledge experts and content/course selection differences as possible main problems in the quality theme, they basically see the differences among graduates and accreditation as possible problems in the standardization theme.

**Effects of content/pedagogical content knowledge experts:** Concerns such as not including all lecturers from the fields of content and pedagogy in the process of developing new programs, acting according to the decisions of some dominant groups, not being able to establish cooperation between both groups of lecturers and opening courses in an uncoordinated manner, which may result in a content structure dominated by content knowledge courses, were strongly emphasized by the participants. They also emphasized the problem of attaching greater importance to political or personal interests than the goals of training qualified teachers.

These concerns may be due to the scarcity of studies on the structure of teaching staff in institutions that train teachers (Yıldırım, 2013). Studies stating that with the previous structuring, 64.00% of the faculty members from almost every field in education faculties had their doctoral dissertations on subjects other than education (Gençdoğan, 2004), that while transferring the courses of their own fields to ITE programs, very few of them turned to field of education (Saylan, 2013), that they continued to work on their fields in their teacher education programs (Yüksel, 2015), that this situation made ITE programs similar to the programs of the faculties of science and letters over time (HEC, 1998) and that all these were effective in paving the way to the 1997 restructuring might have caused these concerns to be experienced by the participants. This dual structure of education faculties in terms of academic human resources may have caused hesitation about where and how to start the work.

**Content/course selection differences:** The continued concerns are about the preclusion from the expertise of the instructors, the differences in selection and crediting of courses according to the fields, and consequent reflections on the quality of graduates. These concerns show similarities with the negativities caused by the mission confusion previously experienced by teacher education institutions (HEC, 1998; Kavak et al., 2007). In particular, the critical attitudes of the instructors in matters such as the number of courses, crediting or content organization of each institution were also pointed out in the study of Dönmez-Yapucuoğlu and Gündoğdu (2020). The C&I specialists are particularly concerned that institutions that train teachers, which lack academic human resources and physical facilities, will be disadvantaged.

**Standardization:** The C&I specialists emphasized that the implementation of authentic programs might cause differences in the competencies of graduates. This situation, which can be seen as an opportunity for the selection of the best in teacher appointments, is seen as a possible negativity when viewed from the perspective of pre-service teachers who can be appointed by passing standard exams. At this point, although it seems that this negativity can be overcome to some extent with solutions such as matching the content validity of national exams with the general competencies of the teaching profession, it seems difficult to compensate for the wasted effort, time and dreams of pre-service teachers (Saylan, 2013). This situation has the potential to exacerbate the “issue of unappointed teachers” (Çınkır, & Kurum, 2017), one of Turkey’s hottest education topics. On the other hand, it is known that the standard in terms of teacher quality cannot be achieved with standard programs in Turkey, but the institutional capacities and the wisdom that will implement those
programs (Darling-Hammond, 2000; Darling-Hammond & Bransford, 2005). Therefore, the standing of teacher education institutions will determine their own future. In brief, the C&I specialists assume that education faculties’ implementing different ITE programs with different qualifications and competencies may fail to achieve a standard in teacher education and quality.

With the new reformatory shift from authority to autonomy, it is expected for C&I departments in faculties to take responsibility as the basic unit ensuring coordination in the operation of the process. Thus, it is thought that coordination within academicians and institutions can be established. The C&I specialists recommend the establishment of independent units, the development of a “core program” in order to enact standards among faculties, the completion of the necessary infrastructure and preparations and the coordination of faculty/personnel in the transition to the new period after the decision of the delegation of authority. As for the sustainability of the new autonomy, they suggest that basic criteria should be determined in the program structure and systematic monitoring studies should be carried out in line with these criteria, but the monitoring should be done by independent accreditation institutions. In this context, as far as our country’s education system is concerned, although it does not seem easy to move from a centralized structure to a creative, unique and autonomous system (Doğan, 1999; Kavak, 1999), it should not be seen as impossible.

CONCLUSION AND RECOMMENDATIONS

Overall, the study shows possible outcomes of the new decision announced by the HEC, which were justified with different references. While the C&I specialists welcome the decision of the HEC in delegating authority to teacher education institutions with an outlined framework for developing authentic contents, they have concerns that a minimum standard for teacher competences cannot be achieved through ITE programs with different qualifications. Particularly, the idea of meeting local needs of teacher education programs through necessary contents is favored by the C&I specialists. On the other hand, lack of collaboration among teacher educators, disregarding the curriculum specialists in the re-designing procedure, and regarding certain groups’ benefits still continue to bother C&I specialists.

To conclude, although there are promising intentions in the declared reformatory move of the HEC, many teacher educators and curriculum specialists indicate the existing drawbacks of this new decision. Referring to the study results, we believe that there is a new starting point to discuss fundamental needs of teacher education programs. In such a discussion, it is fair to argue that all responsible partners should collaborate following a consented roadmap. There can be discrepancies among teacher education programs of different regions due to locality, yet standards and competencies should be common for each and every teacher-to-be. Finally, in order to ensure sustainability of ITE programs in the new term, the processes should be carried out as participatory and As a conclusion, while the C&I specialists welcome the decision of the HEC to delegate authority so that autonomy can be given to teacher education institutions within the general framework it has drawn and original contents can be developed, they have concerns that a minimum standard for teacher competences cannot be achieved through ITE programs with different qualifications. In order to ensure the development and sustainability of ITE programs in the new term, the processes should be carried out as participatory and transparent as possible, and that C&I experts take an active role as a guide in this sense.

This study is limited to the data collected by online survey from EPÖDER member C&I specialists, and conducting further studies in which the in-depth opinions and recommendations of other C&I experts working in teacher training institutions and other instructors are elicited can be recommended to researchers.

ACKNOWLEDGEMENT

Preliminary results of the study are presented as oral presentation in the Eighth International Congress on Curriculum and Instruction (ICCI-EPOK 2021), 25-27 March 2021, Burdur, Turkey.
REFERENCES


A Study of the Effects of Parental Attention Deficit and Hyperactivity Disorder (ADHD) and Parental Emotion Regulation Processes on Adolescent Self-Regulation Skills

Zeynep Gültekin Ahçi
Kto Karatay University

Seher Akdeniz
Kto Karatay University

Hatice Harmancı
Kto Karatay University

Abstract

Self-regulation is a concept that is frequently studied in the literature and is crucial for humans in their capacity as beings with deliberate will. However, there is a lack of research examining ADHD, which is characterized by difficulties in self-regulation and emotion regulation, particularly in terms of adolescent self-regulation skills via parenting practices. The purpose of this study was to investigate the relationship between parents' emotion regulation approaches toward their children and children's self-regulation skills based on a comparison of self-regulation skills in adolescent children of parents who met and did not meet ADHD diagnostic criteria. 572 parents and their 12-15-year-old children took part in the study. The study was designed as a correlational survey model. The data collected from children and their parents who met and did not meet the ADHD diagnostic criteria were compared using the T-test and then subjected to stepwise regression analyses separately. According to the study's findings, the children of parents who met the diagnostic criteria had lower self-regulation success scores than those who did not. The study discovered that avoidance and orientation to a child's emotions by parents who met ADHD diagnostic criteria were determinants of self-regulation failure. Another finding from the study was that avoidance of emotions by parents who met the ADHD diagnostic criteria was negatively related to self-regulation success. The findings for parents who did not meet ADHD diagnostic criteria revealed that no emotion regulation approach of such parents had a significant contribution to self-regulation failure, whereas the emotion orientation approach had a positive and significant contribution to adolescents' self-regulation success. Finally, the study discusses the findings in light of previous research findings and makes some recommendations for future work.

Keywords: Self-Regulation, Adult ADHD, Parental Emotion Regulation

DOI: 10.29329/ijpe.2022.426.24

1 Zeynep Gültekin Ahçi, Assist. Prof., Psychology, Kto Karatay University, ORCID: 0000-0002-2383-7167
Correspondence: zeynep.ahci@karatay.edu.tr

ii Seher Akdeniz, Assist. Prof. Dr., Psychology, Kto Karatay University, ORCID: 0000-0002-2282-9165

iii Hatice Harmancı, Assist. Prof. Dr., Psychology, Kto Karatay University, ORCID: 0000-0003-4064-5391
INTRODUCTION

Self-regulation is an essential concept for humans in their capacity as beings with a deliberate will, a concept that refers to humans' ability to change their reactions or inner state in a goal-oriented manner (Vohs and Baumeister, 2004). In this process, people activate and monitor their behaviour, attention, emotion, and cognitive strategies in line with both external and internal stimuli, as well as feedback from others, maintaining their behaviour resolutely or changing it based on the requirements of the situation they are in (Moilanen, 2007). It can be seen that self-regulation abilities determine a person's functional level in almost every aspect of life. Robson et al. (2020) discovered that self-regulation skills from early childhood predicted success in academic, social, and professional life, as well as a healthy lifestyle in good mental health in later years of life, in a meta-analysis study combining the results of 150 studies. Any disorder in one or more components of self-regulation causes a variety of social and psychological issues. Endler and Kocovski (2000, pp. 571) found that many self-regulation issues, such as setting unrealistically high goals, constantly monitoring or evaluating themselves or abandoning monitoring themselves, and acting in ways they would not act in other situations, were all linked to various problems such as anxiety, depression, and addiction. Several authors have also provided evidence that self-regulation abilities are linked to externalization and internalization issues (Doan et al., 2012; Lengua, 2003; White et al., 2012).

During self-regulation activities, people frequently encounter situations that elicit emotional responses. As a result, it is suggested that self-regulation processes are closely related to emotion regulation processes (Koole et al., 2011). Emotion regulation refers to the physiological, cognitive, motivational, and/or behavioral processes that determine the emergence, shape, intensity, or duration of emotional states that people initiate, sustain, inhibit, avoid, or adjust in order to achieve biological or social adaptation or to achieve individual goals (Eisenberg & Spinrad, 2004). Emotion regulation plays a critical role in self-regulation processes and forms the basis of motivation to persevere in the pursuit of one's goals (Barkey, 2011). Emotion regulation, as defined by Moilanen (2007), could be frequently addressed as a dimension of self-regulation processes. It has, however, been the subject of separate investigations by some authors. Difficulties with emotion regulation lead to situations such as excessively experiencing emotions, expressing them in ways that are not in accordance with norms, experiencing rapid and uncontrolled emotional transitions, and focusing excessively on emotional stimuli, all of which harm the interests of the individuals involved and prevent them from achieving their goals (Shaw et al., 2014).

According to research, emotion regulation is both an external and an internal process (Thompson, 2011). Emotion regulation in the context of parenting is an important and complementary dimension of both adaptive parenting (Sanders & Mazzucchelli 2013) and emotion regulation (Boden & Thompson 2015; Dix 1991; Thompson 1994). Parents' emotional regulation can be linked to their children's emotional competence via a number of mechanisms. Emotional socialization processes such as parents expressing their own emotions, serving as models in emotion regulation, and reacting to their children's emotional experiences are examples of these. Parents' awareness of the child's emotions, acceptance and approval/validation of the child's emotions, talking about emotions, and assisting the child in understanding and regulating her or his own emotions are examples of supportive responses (Havighurst & Kehoe, 2017). Non-supportive and/or non-adaptive parental responses, on the other hand, generally include child-rearing styles based on responses such as punishment, ignoring, and anger (Brand & Klimes-Dougan, 2010, p. 91). According to research, the children of parents who use non-adaptive emotion regulation approaches have a variety of internalization and externalization issues (Garner et al., 2008; Shipman et al., 2007; Suveg et al., 2008). Non-adaptive parental responses are also related to how effective parents are at regulating their own emotions (Buckholdt et al., 2013).

Attention deficit and hyperactivity disorder (ADHD) is defined as a neuro-developmental disorder characterized by chronic inattention and/or hyperactivity-impulsivity that impairs functionality or development (DSM V, 2013). According to research, this disorder, which was previously diagnosed primarily in children and adolescents, is now being diagnosed in an increasing number of adults (Brown, 2009). ADHD is generally regarded as a reflection of a person's difficulties
in goal-oriented activities as a result of self-regulation disorders (Nigg, et al., 2006). In terms of emotion regulation, previous research again underlines the correlation between ADHD and difficulties with emotion regulation in both adolescence and adulthood (Barkley & Fischer, 2010; Bunford et al., 2015). Barkley (2014, p. 81) suggests that these people have difficulties with emotion regulation because they are prone to emotional impulsivity and lack emotional inhibition. Difficulties with emotion regulation may also result in non-adaptive reactions of parents in emotion regulation in the context of parenting. Both parents and children have been diagnosed with ADHD in the same family, according to research (Minde et al., 2003), indicating that genetic transition plays an important role in this regard (Faraone & Larsson, 2019). However, parental ADHD is also linked to the prevalence of other internalization and externalization problems in children (Humphreys et al., 2010; Minde, et al., 2003), and research has increasingly focused on the role of several factors in this relationship, including home environment and the nature of intra-family interactions, as well as genetics.

For example, Park et al. (2017) discovered a positive relationship between ADHD symptoms and harsh and lax parenting in general in a meta-analysis combining the findings of 32 studies on parenting behaviours of parents with ADHD. Other studies have looked into the parenting behaviours of parents with ADHD that may contribute to their child's ADHD and other psychopathologies. According to Tung et al. (2015), negative parenting (i.e., corporal punishment, inconsistent discipline, and poor monitoring) is a mediator of the relationship between ADHD observed in both parents and their children. Breaux, Brown, and Harvey (2017) report in another study that maternal over-reactivity mediated the relationship between ADHD symptoms observed in mothers and those observed in children in another study.

However, evaluating parental ADHD in terms of the child's overall cognitive and psychological development, rather than just its relationship with ADHD or other psychopathologies observed in the child, can provide a more inclusive perspective. Given the important contributions made by parenting practices into the development of children's self-regulation skills (Spruijt et al., 2017), it is possible that the various parenting practices of parents with ADHD are more broadly related to the development of self-regulation skills than the psychological problems of their children. Furthermore, given the role of emotion regulation in parenting practices and the importance of ADHD and self-regulation, it is critical to investigate the role of parents' emotion regulation behaviours in this relationship. Adolescents experience more intense positive and negative emotions, and their emotional instability is higher than adults, which has been observed in parallel with biological, psychological, and social changes (Bailen et al., 2019). As a result, how parents respond to their adolescent children's increasing emotional regulation needs may be a determinant in the self-regulation skills of adolescents still in development.

The study's goal was to look into the relationship between parents' emotional regulation processes toward their children's negative emotions and adolescents' self-regulation processes, specifically as a parenting practice. ADHD, which is characterized by difficulties with self-regulation and emotion regulation, can be especially expected to be associated with adolescent self-regulation skills through parenting practices. To that end, the study compared the self-regulation skills of children of parents who met and did not meet the ADHD diagnostic criteria, as well as the relationship between the emotional regulation approaches of parents who met the ADHD diagnosis criteria and their children's self-regulation processes. The study not only determines the nature of the contribution of parents' emotional socialization processes in the development of self-regulation skills in adolescence, but it also provides insights into the variables that should be considered in the intervention of parenting approaches of adults diagnosed with ADHD.

To that end, this study seeks to address the following questions:

1. Is there a significant difference between the self-regulation success and failure scores of adolescent children of parents who meet and who do not meet ADHD diagnostic criteria?
2. Are parental emotion regulation scores of parents who meet ADHD diagnostic criteria significant predictors of adolescent children's self-regulation success scores?

3. Are parental emotion regulation scores of parents who meet ADHD diagnostic criteria significant predictors of adolescent children's self-regulation failure scores?

4. Are parental emotion regulation scores of parents who do not meet ADHD diagnostic criteria significant predictors of adolescent children's self-regulation success scores?

5. Are parental emotion regulation scores of parents who do not meet ADHD diagnostic criteria significant predictors of self-regulation failure scores in adolescent children?

**METHOD**

**Participants**

The study included 572 participants, including 286 parents with children aged 12 to 15 and their children (N=286). There were 172 mothers (60.1%) and 114 fathers among the participants (39.9%). The participants' average age was 42.19 (Range=24-68). According to the self-report scale evaluation, 103 (36%) of the parents met the ADHD criteria, while 183 (64%) did not. There were 138 girls (48.3%) and 148 boys among the children (51.7%). The children's average age was 13.41 (Range = 12-15).

**Measures**

**Parental Emotion Regulation Scale (EPAS):** The Parental Emotion Regulation Skills Scale was developed by Pereira et al. (2017) as a multidimensional scale to be used to evaluate parents' approaches to regulating negative emotions in the context of parenting. It consists of 20 items and four sub-dimensions, namely the parent's orientation to the child's emotions, the parent's avoidance of the child's emotions, the parent's lack of emotional control, and the parent's acceptance of the child and his/her emotions.

The scale's adaptation study in Turkish was conducted on parents with children aged 3-15 (Gültekin Ahçıt et al. 2020). The Confirmatory Factor analysis produced a structure consisting of 13 items and three sub-dimensions. Parental orientation to the child's emotions, parental avoidance of the child's emotions, and parental acceptance of the child and his/her own emotions were the sub-dimensions generated. While the overall scale's internal consistency value was .76, the split-half reliability value was .71. While internal consistency coefficients for the sub-dimensions were set at .78, .79, and .75, respectively, split-half reliability values for the sub-dimensions were found to be .73, .74, and .71, respectively.

**ADHD DSM Scale:** Metin et al. (2018) translated the ADHD DSM Scale, which was originally developed by Kooij et al. (2005). The scale is a 23-item self-report scale used to assess symptoms of Attention Deficit and Hyperactivity Disorder in adults using DSM IV and DSM V criteria. Attention deficit and hyperactivity sub-dimensions are evaluated on a four-point Likert-type scale on the 23-item scale (0 = never or rarely, 1 = sometimes, 2 = frequently, and 3 = very frequently). A score of 2 or higher in any item indicates the occurrence of that symptom, indicating that the criterion measured has been met.

It was given to 225 adults aged 18 to 62 in the adaptation study. While the Cronbach's alpha value obtained from the overall ADHD DSM Scale for internal validity was 0.9, it was 0.89 for the attention deficit sub-scale and 0.84 for hyperactivity/impulsivity. The study discovered a correlation of 0.84 (p <0.001) between ADHD DSM scale scores and ASRS scores, and one of 0.79 (p <0.001) between hyperactivity scores, based on an examination of the scale's correlations with the ASRS ADHD scale and the DIVA interview inventory performed for the scale's concurrent validity. An
investigation into the relationship between the ADHD DSM Scale sub-dimensions and the DIVA sub-dimensions in terms of the number of criteria met revealed a value of $r = 0.48$ ($p < 0.001$) for attention deficit and one of $r = 0.34$ ($p = 0.02$) for hyperactivity.

**The Self-Control Skills Scale in Adolescents:** The scale, developed by Moilanen (2005) and translated into Turkish by Harma (2008), aims to assess adolescents’ self-regulation abilities. It is designed as a self-report scale with 32 items that is graded on a four-point Likert-type scale. The scale has two sub-dimensions: self-regulation success and self-regulation failure, which are designed to assess an individual's ability to activate, monitor, maintain, and prevent attention, thoughts, emotions, and behaviours. According to the findings, the scale's sub-dimensions of self-regulation success and self-regulation failure explained 19.15% and 10.07% of the variance, respectively. Internal consistency coefficients for self-regulation success were 0.85 and 0.79 for self-regulation failure.

**Procedure**

The relational survey model was used to design the study, which aimed to determine the relationships between the variables (Gürbüz & Şahin, 2017). The study’s data collection tools were developed in an online environment using the Google form platform. The forms to be completed by parents and children aged 12 to 15 were designed separately. The study’s ethics committee approved it, and the adolescent participants were asked to respond to the section of the form assigned to them if their parents agreed that they could participate in the study and indicated it on the form. The responses of five parents whose children were not between the ages of 12 and 15 were excluded. Data from 9 people with extreme value characteristics were removed from the data set as a result of extreme value analysis. The results of the kurtosis and skewness values examined to investigate the normality of the data show that the values remained between -1 and +1, and the results of the histograms show that the distributions of the data met the assumption of normality. The parents in the study were diagnosed with Attention Deficit and Hyperactivity as a result of the data obtained from the ADHD DSM Scale, based on coding done by the psychiatrist, the third author of the study, by categorizing the participants into two groups, namely those who met the diagnostic criteria in at least one of the three subfields of attention deficit, hyperactivity, or mixed type, or those who did not meet the criteria in any of the fields. SPSS 22.00 was used to analyse the data. The T-test was used to compare the self-regulation success and failure scores of the adolescents in the two groups to see if there was a difference in self-regulation skills between the children of parents who met ADHD diagnostic criteria and the children of those who did not. Then, stepwise regression analysis was used to see if the PERS scores of the parents who met and did not meet the ADHD diagnostic criteria predicted the adolescents' self-regulation scores.

**FINDINGS**

To see if the self-regulation success scores of children whose parents met and did not meet the ADHD diagnosis criteria differed significantly, the children’s self-regulation success and failure scores were compared using the Independent Samples T-test. Table 1 displays the findings of this analysis.

**Table 1: The Independent Sample T-test results used to investigate the self-control success and self-control failure scores of children of parents diagnosed with and without ADHD**

| Self-regulation Success | N   | X     | Sd    | t    | p   | Self-regulation Failure | N   | X     | Sd    | t    | p   |
|-------------------------|-----|-------|-------|------|-----|-------------------------|-----|-------|-------|------|-----|-------------------------|-----|-------|-------|------|-----|
| Parents who met ADHD    | 103 | 44.29 | 8.48  |      |     | 103                     | 37.58 | 5.93  |      |     |     |
| diagnostic criteria     |     |       |       | -3.14| .002|                         | 1.73 | .083  |      |     |     |
| Parents who did not     | 183 | 47.66 | 8.83  |      |     | 183                     | 36.27 | 6.21  |      |     |     |
| meet ADHD diagnostic    |     |       |       |      |     | criteria                |     |       |      |     |     |

* $p < .05$
** $p < .01$
Table 1 shows that the self-regulation success scores of children whose parents meet ADHD diagnosis criteria are significantly lower than those of children whose parents do not (t\(_{286}=-3.145; p<0.01\)). The study, on the other hand, discovered no significant difference in the self-regulation failure scores of the children of the two parent groups (t\(_{286}=-1.73; p>0.05\)). Based on these findings, it is possible to conclude that parental ADHD is unrelated to their children's inability to self-regulate. It is, however, related to their children's success with self-regulation.

**Results of the Regression Analysis**

Separate stepwise regression analyses were performed for parents who met and did not meet the ADHD diagnostic criteria to determine how much parental emotion regulation scores influence their children's self-regulation success and failure. To begin, correlation analysis values were examined to see if the data met the assumptions of multiple linear regression, and whether the correlation coefficients had a value of 80 or more. Durbin Watson, VIF, and Tolerance values were examined in the second step. The research questions were tested by establishing a regression model after the results indicated that the obtained data were within the statistically desired limits. Table 2 displays the variables' mean, standard deviation, and correlation coefficients.

Table 2: The mean, standard deviation, and correlation coefficients of PERS scores from parents who met ADHD diagnostic criteria, as well as scores from children regarding self-regulation success and failure (N = 103)

<table>
<thead>
<tr>
<th>Variables</th>
<th>X</th>
<th>Sd</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-regulation failure in children</td>
<td>37.5825</td>
<td>5.93184</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. Self-regulation success in children</td>
<td>44.2913</td>
<td>8.48370</td>
<td>-3.39**</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3. PERS Avoidance</td>
<td>10.4854</td>
<td>2.87608</td>
<td>0.283**</td>
<td>-2.23*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. PERS Orientation</td>
<td>14.7961</td>
<td>3.05941</td>
<td>-1.129</td>
<td>0.048</td>
<td>0.207*</td>
<td>-</td>
</tr>
<tr>
<td>5. PERS Acceptance</td>
<td>8.7767</td>
<td>1.60228</td>
<td>-0.103</td>
<td>-0.087</td>
<td>0.313**</td>
<td>0.141</td>
</tr>
</tbody>
</table>

*p <.05

**p <.01

Table 3 shows the results of the stepwise regression analysis.

Table 3: The findings of the stepwise regression analysis on the prediction of self-regulation success and failure in children of parents who do not meet ADHD diagnostic criteria

<table>
<thead>
<tr>
<th></th>
<th>Self-regulation Success</th>
<th>Self-regulation Failure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Variable</td>
<td>B</td>
<td>Sd</td>
</tr>
<tr>
<td>Model 1</td>
<td>Constant</td>
<td>51</td>
<td>.96</td>
</tr>
<tr>
<td>R²=.05 Adjusted</td>
<td>PERS Avoidance</td>
<td>-.65</td>
<td>.30</td>
</tr>
<tr>
<td>R²=.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 2</td>
<td>Constant</td>
<td>36.21</td>
<td>3.13</td>
</tr>
<tr>
<td>R²=.11 Adjusted</td>
<td>PERS Avoidance</td>
<td>.66</td>
<td>.19</td>
</tr>
<tr>
<td>R²=.10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p <.05

**p <.01

Only avoidance of parental emotion regulation by parents meeting ADHD diagnostic criteria has a negative and significant predictive effect on their children's self-regulation success (F \(_{1101}=\) 5.29 p <.05), according to Table 3. The regression model excluded PERS orientation and PERS acceptance because they had no predictive effect. PERS avoidance also explains 4% of the variance in children's self-regulation success (Adj. R² value = .04).

The PERS orientation and PERS acceptance of parents meeting ADHD diagnostic criteria were excluded by the regression model in the first model designed to predict self-regulation failure.
because they did not have a predictive effect. The data show that the PERS Avoidance has a statistically significant contribution ($F(1,101) = 8.77, p < .01$). The $R^2$ value after correction is 0.07. As a result, the sub-dimension of PERS avoidance can be said to explain 7% of the variance in self-regulation failure in children. PERS acceptance was excluded from Model 2 because it had no predictive effect. The regression of the PERS orientation explained 3% of the additional variance, which was found to be significant ($F(2,100) = 6.60, p < .01$). According to the findings, all of the independent variables explain 10% of the overall variance in self-control failure in children.

Table 4: The mean, standard deviation, and correlation coefficients for PERS scores of parents who were not diagnosed with ADHD and their children's scores for self-regulation success and failure ($N=183$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-regulation Failure of children</td>
<td>36.2732</td>
<td>6.21958</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-regulation Success of children</td>
<td>44.2913</td>
<td>8.48370</td>
<td>-353**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERS Avoidance</td>
<td>10.4208</td>
<td>2.82318</td>
<td>.131</td>
<td>.018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERS Orientation</td>
<td>15.6557</td>
<td>2.78863</td>
<td>-.079</td>
<td>.321**</td>
<td>.161*</td>
<td></td>
</tr>
<tr>
<td>PERS Acceptance</td>
<td>8.5902</td>
<td>1.67769</td>
<td>-.071</td>
<td>.224**</td>
<td>.290**</td>
<td>.290**</td>
</tr>
</tbody>
</table>

*p < .05

**p < .01

Table 5 displays the results of the regression analysis.

Table 5: The Findings of the Stepwise Regression Analysis Concerning the Prediction of Self-Regulation Success and Failure in Children of Parents Who Meet ADHD Diagnostic Criteria

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Variable</th>
<th>$B$</th>
<th>$Sd$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$R^2$</th>
<th>Adj.$R^2$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$\beta$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>R$^2$=.10.3</td>
<td>Constant</td>
<td>31.76</td>
<td>3.548</td>
<td>8.951</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj.R$^2$=.098</td>
<td>PERS Orientation</td>
<td>1.016</td>
<td>.223</td>
<td>.321**</td>
<td>4.55**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>37.569</td>
<td>3.371</td>
<td>11.143</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERS</td>
<td>.323</td>
<td>.164</td>
<td>.146</td>
<td>1.962</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance</td>
<td>-.197</td>
<td>.174</td>
<td>-1.134</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERS</td>
<td>-.183</td>
<td>.285</td>
<td>-.641</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 shows that only PERS-orientation in parents who do not meet ADHD diagnostic criteria has a positive and significant predictive effect on their children's self-regulation success ($F(1,181) = 20.73, p < .01$). The regression model excluded PERS avoidance and PERS acceptance because they had no predictive effect. PERS orientation also explains 10% of the variance in their children's self-regulation success (corrected $R^2$ value = .098). The findings show that emotion regulation approaches directed at children of parents who have not been diagnosed with ADHD have no predictive effect on their children's self-regulation failure ($F(3,179) = 1.822, p > .05$).

DISCUSSION

The purpose of this study was to compare the self-regulation skills of adolescent children of parents who met and did not meet ADHD diagnostic criteria to investigate the relationship between parents’ emotion regulation approaches toward their children and their children's self-regulation skills. To that end, the self-regulation success and failure scores of parents who met ADHD diagnostic criteria and adolescent children of parents who did not were compared, revealing that there was no difference in self-regulation failure between the two groups' children. The results, however, show that the children of parents who met ADHD diagnostic criteria had lower self-regulation success than those who did not. Although there was no significant difference in self-regulation failure, it is possible to interpret the significant difference in self-regulation success as an indication that self-regulation skills
in adolescents are associated with parental ADHD characteristics, regardless of pathology. McQuillan and Bates (2017, pp.85-86) argue that parents with limited cognitive and emotional resources can, in particular, make instant and impulsive decisions and do not pay attention to their children's positive behaviours, or react in a way that creates fear and anger in the child, and do not reinforce the child's positive behaviours, as a result of which they may reduce their children's regulatory functions, and that this is especially true for parents with ADHD low regulatory skills. According to a study that supports this finding, Biederman et al. (2002) report that ADHD diagnoses in parents are not associated with an increased risk of dysfunction, except for those associated with disorders in their children with ADHD, but they are associated with poor school performance in children who do not have ADHD.

The role of parents' emotional socialization processes in their adolescent children's self-regulation was investigated in the following stage of the research. Based on the findings, it is possible to conclude that the avoidance of emotions and orientation toward emotions of parents who met the ADHD diagnostic criteria were related to self-regulation failure. As a result, while the parents' negative beliefs about the child's negative emotions and efforts to get rid of these emotions, a condition defined as emotion avoidance, are associated with an increase in self-regulation failure, efforts to deal with and understand the child's emotions, which is defined as an orientation to emotions, are associated with a decrease in self-regulation failure. This condition suggests that the emotion regulation strategies of adolescent children of parents who met ADHD diagnostic criteria may be a determinant factor in their children's self-regulation failure. On the other hand, it has been discovered that the avoidance of emotions of parents who met ADHD diagnostic criteria is also negatively related to self-regulation success. These findings suggest that parents' avoidance of negative emotions and general orientation toward emotions play an important role in the development of self-regulation in their interactions with their adolescent children. With efforts in the development of emotion regulation in children, Eisenberg, Smith, and Spinrad (2011, p.275) emphasize the importance of parents' responses in a way that teaches their children effective strategies to control their emotions. By avoiding their adolescent children's emotions, parents may be denying their adolescent children the opportunity to adopt strategies that are important for the development of self-regulation skills. In a study supporting the results observed in the present study, Buckholdt et al. (2014) report that parental neglect and punishment mediated the relationship between parents and adolescents' emotion dysregulation, and argue that they can be important mechanisms in the transmission of emotion regulation difficulties. Other studies have found that methods such as criticizing, avoiding, and minimizing negative emotions are negatively related to emotional and behavioral regulation skills (Eisenberg, Fabes and Murphy, 1996; Lunkenheimer et al., 2007). On the other hand, making an effort to understand children's emotions and showing interest in them may help them regulate their emotions and, as a result, improve their general self-regulation skills.

The findings for parents who did not meet the ADHD diagnostic criteria show that no emotion regulation approach by parents has a significant contribution to self-regulation failure. The findings, on the other hand, show that the emotion orientation approach has a positive and significant impact on adolescent self-regulation success. This finding suggests that, in general, parents' interest in and efforts to understand their children's emotions are important in terms of self-regulation, and that this holds true in adolescence.

When the findings of the two groups were compared, it was discovered that the emotional socialization approaches of the parents were more determinant, particularly for the children of parents who met ADHD diagnostic criteria. Emotion regulation approaches of parents who met ADHD diagnostic criteria were associated with both self-regulation success and failure. Emotion regulation appears important in terms of self-regulation success for children of parents who did not meet ADHD diagnostic criteria, but it does not contribute to self-regulation failure.

One possible explanation for this situation is that the home environment of ADHD parents is more chaotic, with inconsistent and negative parenting behaviours observed more frequently in such environments (Mokrova et al., 2010; Park et al., 2017). Previous research has highlighted the significance of the home environment and parenting behaviour in the development of self-regulation.
skills (Finkenauer et al., 2005; Holmes et al., 2019). Therefore, in a chaotic home environment, whether parents' emotion regulation towards the adolescent's emotions is supportive or not may play a critical role in the adolescent's self-regulation skills. Furthermore, it could be suggested that children of parents who are diagnosed with ADHD are genetically in the risk group even if they are not diagnosed themselves, and that parental behaviors and whether the home environment is supportive or not are particularly important in the development of self-regulation.

A review of the literature reveals that the majority of studies on ADHD and parenting have focused on parents of children with ADHD, with only a few studies on parenting of parents with ADHD symptoms and its effects on their children's development (Johnston and Mash 2001). Aside from its contributions to the current body of literature, the current study has some limitations. To begin with, some important variables in emotional socialization were not investigated in the study. It should be noted, for example, that a variety of factors such as the general emotional climate in the family and the general emotional reactions of parents in a household may contribute to the development of children's self-regulation processes. Another significant limitation was that the ADHD diagnosis research team's psychiatrist doctor established the ADHD diagnosis on the parents based on the data obtained from the self-report scales while taking the DSM-5 criteria into consideration. This limitation should be taken into account when interpreting the statements of ADHD-diagnosed parents. Previous research, however, has argued that adults can provide a reliable explanation for their current symptoms (Murphy & Schachar, 2000). The study was also limited by the fact that the gender difference in parents' ADHD could not be represented by a large enough sample size. Finally, longitudinal studies should be conducted in the future to evaluate ADHD symptoms in parents separately.

REFERENCES


The Impact of Cognitive and Affective Components of Test Anxiety on the High-Stakes Exam Performance in 12th Grade Students

Yusuf Ziya Kültür
Ministry of National Education

Bahadır Özcan
Adıyaman University

Abstract

The high-stakes exams are administered to the candidates to determine their placement into university programs. One of the variables that can influence the performance of high-stake exams is test anxiety. The current study aimed to examine the associations between the cognitive and affective components of test anxiety with the performance of the high-stakes exam (University Entrance Exam [UEE]) in low-achiever, mid-achiever, and high-achiever groups after controlling for gender. The study participants were 264 12th-grade students from schools representing low-, mid-, and high-achievement groups. The findings showed that the cognitive and affective components of test anxiety did not account significantly for the variance of test performance on the UEE controlling for gender in the three groups. However, test anxiety’s cognitive and emotional components had negative significant but weak relationships with test performance in only the high-achiever group. Appropriate implications for practitioners, policymakers, and researchers are discussed.

Keywords: test anxiety, test performance, high school, affective, cognitive

Keywords: Test Anxiety, Test Performance, High School, Affective, Cognitive

DOI: 10.29329/ijpe.2022.426.25
INTRODUCTION

Standardized tests have a crucial potential to determine the transition of individuals from high school to university education. The high school period is a critical one for students to prepare for the exam to continue their university education in their preferred programs (Kapıkıran, 2020). In the transition from high school to university education, standardized achievement tests with a more weighted effect are used in addition to school grades. Consequently, an individual's academic achievement is the most crucial determinant of his/her career and socioeconomic status (Spinath, 2012). In other words, an individual's performance on academic tests has important academic, social, and professional consequences (Knoll et al., 2019).

Recently, the importance of university education has increased in Turkey (Güler & Çakır, 2013). In 2019, 1,880,800 candidates took the Field Qualification Test-Alan Yeterlik Testi (AYT) part of the University Entrance Exams (UEE), and according to the exam results, 409,587 candidates were placed in undergraduate programs (OSYM, 2019). On the other hand, students who want to enroll in prestigious universities or programs equal approximately 5% of exam candidates; this puts pressure on students and causes stress and anxiety (Barlas et al., 2010). The concept that includes negative emotional reactions accompanying situations in which performance is measured or evaluated is test anxiety (Mcdonald, 2010). A student's performance measurement may reflect the student’s ability or achievement on the exam or indicate his/her ability to cope with stress and anxiety as a result of the assessment experience; thus, the measurement of any unique ability or proficiency here can be confused with anxiety (Zeidner, 2007). In this context, the importance of revealing the relationship between the students' test anxiety and achievement on the UEE becomes apparent.

Anxiety is frequently described as an unpleasant emotional mood characterized by feelings of stress, fear and worry, and stimulation of the central nervous system (Spielberger, 1972). When anxiety is mild, it acts as a warning signal for individuals; the accompanying physiological and psychological arousal can help the person maintain alertness and eventually embodies a threat that can perform adaptive coping actions (Spielberger, 1972). Although anxiety can be advantageous if it promotes alertness, when it cannot be handled correctly and is spread over a long period of time, it negatively affects students (Barrows et al., 2013).

According to cognitive load theory, in test anxiety some part of the executive memory capacity is allocated to the anxiety; as a result, the individual underperforms due to the inability to use all of his/her executive memory resources, which can lead to poor academic performance (Grimley & Banner, 2008; Mavilidi et al., 2014). On the other hand, in control value theory, test anxiety refers to universal and species-specific characteristics of the human mind that include an individual's emotional reactions to success or failure due to evaluation processes (Pekrun, 2006). More specifically, Liebert and Morris (1967) described two dimensions of test anxiety: affectivity and delusion, which is the cognitive dimension of test anxiety, including negative evaluations and thoughts about the individual's own performance. The affective dimension of test anxiety refers to the individual's emotional reactions to situations such as success or failure in the evaluation process (Pekrun, 2006). It also refers to biological reactions such as increased heart rhythm, sweating, chills, stress, tension, and nervousness when the individual is tested (Bal-Incebacak et al., 2019). These emotional reactions are closely related to the subjective control over the evaluation process and the importance one attributes to the results of an evaluation (Ringeisen et al., 2016). In other words, test anxiety arises from an interaction between low subjective control and high subjective value attributed to performance outcomes and is the result of low control over outcomes (Boehme et al., 2017).

The cognitive components of test anxiety are negatively related to academic performance (Cassady & Johnson, 2002; Crişan & Copaci, 2015; Eum & Rice, 2011; Gibbons et al., 2018; Hancock, 2001; Putwain & Symes, 2018; Zeidner, 1998). On the other hand, high anxiety in individuals with a strong working memory capacity has positive results on test performance (Owens et al., 2014). Individuals with high anxiety can also use compensatory strategies to achieve reasonable performance (Eysenck & Derakshan, 2011). However, high-risk tests are significantly associated with
higher test anxiety than classroom tests (McDonald, 2010; Segool et al., 2013). When test anxiety in education was examined, it was associated with academic achievement (Ergene, 2011), motivation (Elliot & McGregor, 1999), low test performance (Chapell et al., 2005), and gender (Chapell et al., 2005; Ergene, 2011; Erturan & Jansen, 2015; Eum & Rice, 2011; Güler & Çakır, 2013; Kocabıyık & Bacıoğlu, 2020; Núñez Peña et al., 2016; Zeidner, 1990). Considering the relationship between gender and test anxiety in the studies, gender was used as a control variable in this study.

**Present Study**

As stated in our review, there is a negative relationship between test anxiety and performance. Moreover, test anxiety and its components accounted for the variance of achievement, which ranged from 2% to 7% (von der Embse & Witmer, 2014). Test anxiety and its components explain a low part of the variance of test performance. However, the research did not examine the extent to which certain aspects of test anxiety explained variance of test performance in different achievement groups in the Turkish sample. The current study examined relationships between test anxiety's cognitive and emotional components with subsequent test performance on the UEE in low-achiever, mid-achiever, and high-achiever groups after controlling for gender. Specifically, this study addressed the following questions:

1. What is the relationship between the cognitive components of test anxiety and high-risk test performance in three different achievement groups (high-, mid-, and low-achievers) after controlling for gender?

2. What is the relationship between the affective components of test anxiety and high-risk test performance in three different achievement levels after controlling for gender?

**METHOD**

The current study was correlational research. A correlational study is a research design in which the researcher attempts to understand the kinds of naturally occurring variables that relate to each other (Fraenkel et al., 2012). The criterion variables of the study were test performance on the UEE in low-achiever, mid-achiever, and high-achiever groups. Test anxiety's affective and cognitive components were the predictor variables, and gender was the control variable.

**Participants**

In this study, we used the purposive sampling method to select participants. Participants in the study were students studying in 12th-grade high schools located in a mid-sized city center in Turkey with about 85,000 inhabitants. Seven academic high schools provide academic education in the city center. The criteria that determined the high schools were the UEE results. Schools were categorized into three groups, taking into account their achievement in this exam: high-achievers, mid-achievers, and low-achievers. We chose one of the schools to represent each achievement group. These three schools’ performances on the UEE out of 120 questions were $M = 26.13, SD = 9.05$ for low-achievers, $M = 39.80, SD = 9.92$ for mid-achievers, and $M = 75.95, SD = 14.72$ for high-achievers. When one considers the mean and standard deviation scores of the UEE performances of each group, the three selected schools represented the three achievement groups.

In the study, 264 12th-grade high school students participated. The participants consisted of 88 (40.5%) students in the low-achiever group, 80 (28.8%) students in the mid-achiever group, and 96 (30.7%) students in the high-achiever group. There were 163 male (59.1%) and 101 female (40.9%) participants in the study.
Instruments

Test Anxiety Inventory

The Test Anxiety Inventory (TAI) is a 20-item self-report instrument developed by Spielberger (1980) to measure individual differences in test anxiety as a situation-specific personality trait. It examines how often a test taker reports the experience of specific symptoms of anxiety before, during, and after examinations, using a 4-point Likert scale ranging from 1 (almost never) to 4 (almost always). Higher scores indicate higher levels of test anxiety. The TAI has two subscales: (1) “worry,” which includes cognitive concerns about the consequences of failure (e.g., “I believe I am going to fail the test”) and (2) “emotionality,” which includes the different reactions of the autonomic nervous system resulting from stress experienced during an evaluative process (e.g., “my heart beats faster when I am taking a test”). The TAI has adequate psychometric properties with three-week test-retest reliability, $r = .80$, and concurrent validity with other test anxiety measures, $r = .82$ (i.e., Sarason’s TAS) (Spielberger, 1980). Internal consistency was $\alpha = .88$ for worry and $\alpha = .90$ for emotionality.

The TAI was adapted to Turkish by Albayrak-Kaymak (1987). The test-retest reliability of the scale ranged from $r = .70$ to $r = .90$. The internal consistency coefficient for the "worry" subscale was $\alpha = .83$, while that for the "emotionality" subscale was $\alpha = .84$ (Albayrak-Kaymak, 1987). We used the worry and emotionality subscales of the TAI in the current study.

Test Performance on the UEE

A national two-stage examination system determines access to tertiary education and places students into different programs. The first stage is the Basic Proficiency Test-Temel Yeterlilik Testi (TYT), previously known as the Transition to Tertiary Education Examination ‒ Yükseköğretime Geçiş Sınavı (YGS). It is a multiple-choice assessment of core subjects such as Turkish, social sciences, mathematics, and science. Passing the TYT is sufficient to access the short-cycle tertiary programs in which most students are enrolled. Students' preferences and results in the YGS and their average classroom marks during high school are used to determine their placement in short-cycle tertiary and bachelor’s programs through a centralized system that automatically assigns applicants to study programs (Kitchen et al., 2019; OSYM, 2018).

YKS is a three-session exam: Session 1 TYT, Session 2 AYT, and Session 3 Foreign Language Test (YDT). All applicants applying to YKS must take the TYT. Other sessions are optional. TYT is held on the first day, AYT on the second day, and YDT on the afternoon of the second day (OSYM, 2018). TYT consists of four parts and 120 questions, including 40 questions in Turkish, 40 questions in Basic Mathematics, 20 questions in Social Sciences, and 20 questions in Science. Each multiple-choice question has five choices, only one of which is the correct answer. The total time allowed for taking the test is 135 minutes.

From the students’ correct answers provided to 120 TYT questions, the total answer numbers were calculated by subtracting 0.25 lines of 1 wrong answer (MoNE, 2018). In this study, we considered test performance as the total number of calculated true answers by subtracting 0.25 lines of 1 wrong answer over 120 questions of the TYT in which all the students participated. We used the TYT exam as the test performance of the UEE.

Participants were informed about the research process, and the study's informed consent was signed by those students who wished to participate. In the informed consent, participants gave a contact mobile number to the researchers so that they could get the UEE results. The researchers contacted the participants using the phone number provided in the informed consent and received the UEE test performance results.
Data Analysis

We conducted a multiple linear regression analysis with the SPSS 23 program. The multiple regression analysis was run to predict test performance on the UEE from the worry and emotionality components of test anxiety, controlling for gender. The variables in the regression analysis are normally distributed according to skewness, with kurtosis values ranging between -1 and +1 (see Table 1). There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. If the tolerance value is less than 0.1, there might be a collinearity problem (Hair et al., 2014). In this analysis, all the tolerance values are higher than 0.1 (the lowest is 0.301) and there is no collinearity problem between the study’s dependent variables.

RESULTS

We used multiple regression analyses to examine the relationship between the worry and emotionality components of test anxiety and test performance on the UEE, controlling for gender. Descriptive statistics and correlation values of variables entering into regression equality are in Table 1.

Table 1. Descriptive statistics and correlations related to predictor and criterion variables

<table>
<thead>
<tr>
<th>Groups</th>
<th>Variables</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-achiever</td>
<td>Test performance (1)</td>
<td>88</td>
<td>26.13</td>
<td>9.05</td>
<td>.319</td>
<td>.262</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worry (2)</td>
<td>88</td>
<td>17.67</td>
<td>5.66</td>
<td>.178</td>
<td>-.834</td>
<td>-.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emotionality (3)</td>
<td>88</td>
<td>27.80</td>
<td>8.16</td>
<td>-.018</td>
<td>-.686</td>
<td>-.06</td>
<td>84**</td>
<td>.</td>
</tr>
<tr>
<td>Mid-achiever</td>
<td>Test performance (1)</td>
<td>80</td>
<td>39.80</td>
<td>9.92</td>
<td>.034</td>
<td>-.175</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worry (2)</td>
<td>80</td>
<td>15.66</td>
<td>5.28</td>
<td>.540</td>
<td>-.567</td>
<td>.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emotionality (3)</td>
<td>80</td>
<td>25.63</td>
<td>7.47</td>
<td>.229</td>
<td>-.444</td>
<td>.05</td>
<td>.79**</td>
<td>.</td>
</tr>
<tr>
<td>High-achiever</td>
<td>Test performance (1)</td>
<td>96</td>
<td>75.95</td>
<td>14.72</td>
<td>.118</td>
<td>-.454</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worry (2)</td>
<td>96</td>
<td>17.34</td>
<td>5.54</td>
<td>.663</td>
<td>.027</td>
<td>-.18*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emotionality (3)</td>
<td>96</td>
<td>27.80</td>
<td>8.30</td>
<td>.347</td>
<td>-.095</td>
<td>-.17*</td>
<td>.83**</td>
<td>.</td>
</tr>
</tbody>
</table>

Note. N = 264, *p < .05, **p < .001

There were significant negative but weak correlations between test performance on the UEE and worry (r = .18, p < .05) and emotionality (r = .17, p < .05) in the high-achiever group. These findings indicated that in the high-achiever group, as students’ test performance increased, their worry and emotionality decreased. On the other hand, test performance on the UEE did not have significant correlations with worry and emotionality in the low- and mid-achiever groups (see Table 1).

The results of the multiple regression analyses used on test performance on the UEE in the three groups (low-, mid-, and high-achievers) from the worry and emotionality components of test anxiety, controlling for gender, are presented in Table 2.

Table 2. Hierarchical linear regression predicting test performance from worry and emotionality

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Low-achiever (N = 88)</th>
<th>Mid-achiever (N = 80)</th>
<th>High-achiever (N = 96)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>SEB</td>
<td>β</td>
</tr>
<tr>
<td>1</td>
<td>Constant</td>
<td>24.00</td>
<td>1.49</td>
<td>16.14</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>3.60</td>
<td>1.93</td>
<td>.197</td>
</tr>
<tr>
<td>2</td>
<td>Constant</td>
<td>28.57</td>
<td>3.43</td>
<td>8.34</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>4.72</td>
<td>2.17</td>
<td>.258</td>
</tr>
<tr>
<td></td>
<td>Worry</td>
<td>-.07</td>
<td>.32</td>
<td>-.05</td>
</tr>
<tr>
<td></td>
<td>Emotionality</td>
<td>-.14</td>
<td>.23</td>
<td>-.13</td>
</tr>
<tr>
<td>R²</td>
<td>.063</td>
<td>.019</td>
<td>.040</td>
<td></td>
</tr>
<tr>
<td>Adj.R²</td>
<td>.030</td>
<td>-.020</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1.884</td>
<td>.478</td>
<td>1.270</td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 421, *p > .05, **p > .001
The model of the worry and emotionality components of test anxiety to predict test performance on the UEE was not statistically significant in the low-achiever group, $R^2 = .063$, $F(3, 84) = 1.884$, $p > .05$; adjusted $R^2 = .030$. This finding indicated that the worry and emotionality components of test anxiety, which explained a 3% variance of test performance on the UEE, were not a significant predictor of test performance on the UEE in the low-achiever group. Moreover, in the high-achiever group, the worry and emotionality components of test anxiety did not statistically significantly predict test performance, $R^2 = .040$, $F(3, 95) = 1.270$, $p > .05$; adjusted $R^2 = .008$. This finding indicated that worry and emotionality, which explained a 1% variance of test performance, did not statistically significantly predict the test performance on the UEE of the high-achiever group. Lastly, the worry and emotionality components of test anxiety did not statistically significantly predict the test performance on the UEE in the mid-achiever group, $R^2 = .019$, $F(3, 79) = 0.478$, $p > .05$; adjusted $R^2 = -.020$. This finding indicated that worry and emotionality, which explained a 2% variance of test performance, were not significant predictors of students' test performance in the mid-achiever group (see Table 2).

**DISCUSSION**

The current study investigates the variance of test performance on the UEE explained for the worry and emotionality components of test anxiety after controlling for gender in low-, mid-, and high-achiever groups. Concerning the first and second research questions, it was found that the worry and emotionality components of test anxiety did not significantly predict the variance of test performance on the UEE in the three achievement groups after controlling for gender. It was also found that the worry and emotionality components of test anxiety were not significantly associated with test performance in the low- and mid-achiever groups. However, the worry and emotionality components of test anxiety had negative significant but weak relationships with students' test performance in the high-achiever group. These findings are not consistent with the results of several other studies that have shown an association between the cognitive and emotional components of test anxiety and test performance (Chapell et al., 2005; Ergene, 2011; Mcdonald, 2010; Segool et al., 2013; Putwain & Symes, 2018). However, test anxiety's cognitive and affective components have a negative significant but weak relationship with test performance on the UEE only in the high-achiever group. These findings are consistent with the results of several other studies that have shown a negative association between test anxiety and test performance (Cassady & Johnson, 2002; Crișan & Copaci, 2015; Eum & Rice, 2011; Gibbons et al., 2018; Hancock, 2001; Putwain & Symes, 2018; Zeidner, 1998).

Although test anxiety's cognitive and affective dimensions do not significantly predict test performance, they account for the variance of test performance between 1% and 3% in the three groups. Test anxiety’s components accounted for the variance of achievement ranging from 2% to 7% (von der Embse & Witmer, 2014). The particularly small amount of test performance variance accounted for test anxiety and the results of this study seem to question whether developing an intervention program for test anxiety with a big investment for all students is ambiguous. The relatively small and no relationship between test anxiety and test performance warns against a general intervention program for test anxiety for all students; test anxiety interventions focused on students diagnosed with test anxiety. Moreover, investigating the relationship between test anxiety and test performance, especially in students diagnosed with test anxiety, would provide stronger relationships and account for more variance of test performance. In connection to this, developing a test anxiety intervention program only for students diagnosed with test anxiety would be more functional and economical. Consequently, school administrators can use this information to evaluate the costs and benefits of intervention and prevention programs.

In this study, we did not specifically examine the relationship between test anxiety and test performance in the high-risk group of students who may be especially vulnerable to test anxiety. Therefore, researchers should conduct test anxiety and test performance research with the group that has high test anxiety. In addition, examining the variables (e.g., self-efficacy, previous achievement)
that have a stronger relationship with high-stakes examination performance would contribute more to understanding and promoting test performance.

One of the limitations of this study is that test anxiety measures were not applied simultaneously to the test; instead, they were applied about 35 days before testing on the UEE. Future research might involve collecting test anxiety data closer to the time of the high-stakes testing. Another limitation of the study is the use of the total points of high-stakes testing as the indicator of test performance. Future research on the relationship between test anxiety and test performance might also use academic subtests (i.e., math, science, Turkish, social studies).

Test anxiety may positively affect test performance; therefore, when diagnosing problematic test anxiety, one should consider whether test anxiety has either a positive or negative effect on test performance. However, when test anxiety does not adversely impact test performance, this test anxiety should not be seen as a problem, even if it is high. In connection with this, school psychologists and school counselors should seek to foster strategies for identifying students with problematic test anxiety by cooperating with teachers, families, and students in their schools.

In conclusion, the cognitive and affective components of test anxiety account for a low variance of test performance between 1% and 3% in 12th-grade students in three achievement groups (i.e., high-, mid-, and low-achievers). Although test anxiety's cognitive and affective components have negative significant but weak associations with test performance in the high-achiever group, they are not significantly associated with test performance in the low- and mid-achiever groups. However, test anxiety's cognitive and affective components do not significantly account for the variance of test performance in the three groups.

REFERENCES


Society 5.0 in Human Technology Integration: Digital Transformation in Educational Organizations

Zübeyde Yarası
Hatay Mustafa Kemal University

Fikriye Kanath Öztürk
Hatay Mustafa Kemal University

Abstract

In the conducted study, it was aimed to determine the impacts of Society 5.0 on digital transformation in organizations in human technology integration. For this purpose, answers were sought to the questions of changing positions of people in line with changing business conditions, functions of people in the digital world, changing roles of management and managers, expectations of society from managers, how to establish a balance in organizations in the process of technological integration and change. In this research, which was structured in the “phenomenology” pattern within the framework of basic qualitative research, the study group was determined by using the “convenience sampling” method. In this context, the study group of the research consisted of 50 undergraduate students studying at Hatay Mustafa Kemal University, Faculty of Education. As a data collection tool, a semi-structured interview form consisting of five questions was used by the researchers. The data obtained were analysed using the “inductive thematic analysis” method utilize in the analysis of qualitative research. In line with the findings; it is among the results that technology affects people’s positions at work, advanced technology products limit people’s functions in society, Society 5.0 creates a need for transformation in the roles of managers, social expectations from managers change in the process of Society 5.0, and organizational balance is crucial for the digital transformation process.

Keywords: Society 5.0, Super-smart Society, Digital Transformation

DOI: 10.29329/ijpe.2022.426.26
INTRODUCTION

Considering the history of humanity, technological developments and changes have created significant breaking points. From this point of view, technology is considered as a dominant concept that is the driving force in exchange for every period of human history. Society 5.0, which is expressed as the transformation of technology in the human-society dimension, is based on the realization of technological integration by creating harmony and balance between human and technology.

As of today, 66.6% of the world’s population uses mobile phones, 59.5% uses the internet and 53.6% uses social media (We Are Social, 2021). As of the situation from the perspective of Turkey, 79% of people between the ages of 16-74 use the internet; considering internet access from home, it is revealed that the rate is determined as 90.7% (TÜİK, 2020). When considered in the context of these rates, it becomes almost impossible to avoid the effects of technological change and transformation. Therefore, within Society 5.0, it becomes important to be able to analyse the effects of the changing social structure and to be prepared for transformation processes in every field. Being one of these areas, education and educational organizations, are directly affected by the digital transformation process that took place with Society 5.0. Thus, educational approaches and educational institutions are being reshaped with the effect of technology. (Sudibjo et al., 2019). In this process, issues such as raising individuals who are creative, have knowledge of information and communication technologies, are digitally literate and adopting a lifelong learning approach gain importance (Keidanren, 2016; Teichert, 2019). Therefore, determining the change effect of technology in educational organizations, which have an important place in raising individuals equipped with the skills that societies will need in the future, in Society 5.0, or in other words “super-smart societies”, is considered important in preparing organizations for the future so that organizations can survive. In this context, it is aimed to determine the effects of Society 5.0 in human technology integration and digital transformation in the management of educational organizations. In accordance with this purpose; In the research, answers were sought to the questions of changing business lives with digitalization, functions of people in the digital world, changing roles of managers, expectations of society from managers, technological integration, and how organizational balance can be established in the process of change in educational organizations.

Society 5.0

Societies have developed at various stages in the historical process, as shown in Figure 1. Considering these stages, the period in the hunter-gatherer period is Society 1.0; Society based on agricultural production. Society 2.0; Industry-based society with the Industrial Revolution Society 3.0; The knowledge-based society that has emerged with the developments in globalization and information and communication technologies has been expressed as Society 4.0. Society 5.0, which emerged in Japan, is expressed as super-intelligent societies with human-technology interaction, built on the foundations of Society 4.0 and where the effect of technology facilitating human life is at the forefront (Arı, 2021; Fukuyama, 2018; Harayama 2017; Keidanren, 2016; Wang et al., 2018).

Figure 1. Social changes (Obtained from: Keidanren, 2018 http://www.keidanren.or.jp/en/)
Society 5.0 aims to integrate technological developments with society, to reduce concerns about the negative effects of technology and to create societies where technology can be effective. In Table 1, the focal points between Industry 4.0 and Society 5.0 have been expressed. In Industry 4.0, the social structure is more reciprocated as an “information society”, while in Society 5.0, the social structure finds its response as “super smart societies” (Akben & Avşar, 2018; Deguchi et al., 2020; Okan Gökten, 2018; Salgues, 2018). While Industry 4.0 positions technology as an element that increases production with the frequent use of automation systems, Society 5.0 places people at the centre of technological change and innovations (Costa, 2018; Fukuyama, 2018; Prasetyo & Arman, 2017).

Tablo 1. Industry 4.0 and Society 5.0 (Deguchi et al., 2020)

<table>
<thead>
<tr>
<th>Industry 4.0 (Germany)</th>
<th>Society 5.0 (Japan)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td><strong>21st century</strong></td>
</tr>
<tr>
<td><strong>Society</strong></td>
<td>Information Society</td>
</tr>
<tr>
<td><strong>Objectives, scope</strong></td>
<td>Smart factories</td>
</tr>
<tr>
<td></td>
<td>Focuses on manufacturing</td>
</tr>
<tr>
<td><strong>Key phrases</strong></td>
<td>Cyber-physical systems (CPS)</td>
</tr>
<tr>
<td></td>
<td>Internet of Things (IoT)</td>
</tr>
<tr>
<td></td>
<td>Mass customization</td>
</tr>
<tr>
<td></td>
<td>High-level convergence of cyberspace and physical space</td>
</tr>
</tbody>
</table>

In Society 5.0, social needs in different fields are met with advanced technology products such as artificial intelligence (Saracel & Aksoy; Skobelev & Borovik, 2017). In addition, it is also prioritized to increase the quality of life by increasing the welfare and happiness levels of societies with technology-human integration (Serpa & Ferreira, 2018).

Figure 2. The Society 5.0 – A Fusion of All Industry and IT (Keidanren, 2016)

Figure 2 indicates the sectors and digital technologies that will be transformed by Society 5.0. There does not seem to be an area that can be excluded from the transformation effect brought by Society 5.0, which is almost unaffected in society. Each field is interconnected and the change in each field affects the social structure of society. When evaluated on the basis of areas, Society 5.0 appears with different transformation requirements according to areas. Educational institutions, which appear
as one of these areas, are also one of the areas that will transform with Society 5.0. Therefore, the digital transformation of educational institutions and their ability to develop vision which is called the digital age continue to be increasingly important today.

**Society 5.0 and Digital Transformation in the Management of Educational Organizations**

Looking into literature, the concept of digital transformation is frequently used with the concepts of digitalization (digitization) and digitization (digitalization), however, these two concepts, which are thought to have the same meaning, have a semantic difference in terms of different levels of digital technology use (Gong & Ribiere, 2021).

Digital transformation has been defined as increasing the use of digital technologies in order to increase the efficiency of organizations, provide organizational agility, and increase the performance of employees (Henriette et al., 2015). In addition, digital transformation transforms business forms and organizational structures (Berghaus & Back, 2016). Digital transformation has brought radical changes in business and social life (Pflaum & Golzer, 2018). From this point of view, digital transformation is defined as organizational change in a sense. Organizational change takes place in areas such as knowledge management, use of technology, and the interaction of the organization with its internal and external environment (Mazurek, 2019). With the strategies determined to realize the organizational change process, organizations can quickly adapt to changes (Gohil & Deshpande, 2014). Therefore, the digital processes that come with Society 5.0 not only affect the society but also change the organizational structures. In particular, the effects of globalization and the developments in information and communication technologies have laid the groundwork for the development of digital processes. In the following processes, with the Industry 4.0 period, the transition to cyber-physical systems that carry the physical world to the virtual world has begun and the digital transformation effect has started to be felt clearly (Yankın, 2019). It is to such an extent that digital transformation has been evaluated as an important factor for the survival of organizations when the literature is analysed (Schreckling & Steiger, 2017). It can be seen that education, which is the catalyst of the transformation process, takes place in a transformation at important breaking points affecting the society. From the period of Society 1.0 to the period of Society 5.0, from the period of Industry 1.0 to the period of Industry 4.0, education has been in a transformation from Education 1.0 to Education 4.0, and today it is moving towards a transformation from Society 5.0 to Education 5.0 (Uğurlu Eren, 2020). In this context, the competence areas of education administrators have also been changing time to time.

![Figure 3. Digital Competence Area (Obtained from Carretero, Vuorikari & Punie, 2017)](image)

When Figure 3 is analysed, digital competence areas are discussed under five headings according to Carretero, Vuorikari and Punie (2017). The first topic was information and data literacy.
The second title included creating digital content, the third title was communication and collaboration, the fourth title was providing security in digital environments, and the fifth was problem solving competencies (Carretero et al., 2017). When these competence areas are analysed, school administrators should be able to acquire the skills in these competence areas in order to achieve digital transformation. According to Al-Harthi (2017), technological equipment and having digital competencies are among the most important competencies expected from school administrators.

**METHODOLOGY**

**Research Design**

In this research, which was structured with the basic qualitative research method, the “phenomenology” pattern was used. Qualitative research is defined as research in which data are obtained through qualitative data collection processes such as observation, interview or document analysis in the natural flow of perceptions and events (Yıldırım & Şimşek, 2011). In the phenomenology design, the focus of the research is to reveal the perceptions and thoughts about the phenomenon in detail (Groenewald, 2004). Thus, with the phenomenology design, the experiences of the participants regarding the phenomena can be revealed in detail (Annells, 2006; Christensen et al., 2015). With Society 5.0, it is aimed to reveal the thoughts on digital transformation in educational organizations.

**Study Group**

The study group was determined by using the “convenience sampling” method. In this context, the study group of the research consisted of 50 undergraduate students studying at Hatay Mustafa Kemal University Faculty of Education in the 2020-2021 academic year. The data related to the study group are given in Table 2.

**Table 2. Demographic Information of Participants**

<table>
<thead>
<tr>
<th>Participant Code</th>
<th>Gender</th>
<th>Class</th>
<th>Participant Code</th>
<th>Gender</th>
<th>Class</th>
<th>Participant Code</th>
<th>Gender</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT-1</td>
<td>Woman</td>
<td>1</td>
<td>PT-15</td>
<td>Man</td>
<td>3</td>
<td>PT-29</td>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>PT-2</td>
<td>Man</td>
<td>1</td>
<td>PT-16</td>
<td>Woman</td>
<td>3</td>
<td>PT-30</td>
<td>Man</td>
<td>3</td>
</tr>
<tr>
<td>PT-3</td>
<td>Woman</td>
<td>1</td>
<td>PT-17</td>
<td>Woman</td>
<td>3</td>
<td>PT-31</td>
<td>Man</td>
<td>3</td>
</tr>
<tr>
<td>PT-4</td>
<td>Man</td>
<td>1</td>
<td>PT-18</td>
<td>Woman</td>
<td>3</td>
<td>PT-32</td>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>PT-5</td>
<td>Man</td>
<td>1</td>
<td>PT-19</td>
<td>Woman</td>
<td>3</td>
<td>PT-33</td>
<td>Man</td>
<td>3</td>
</tr>
<tr>
<td>PT-6</td>
<td>Woman</td>
<td>1</td>
<td>PT-20</td>
<td>Woman</td>
<td>3</td>
<td>PT-34</td>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>PT-7</td>
<td>Woman</td>
<td>1</td>
<td>PT-21</td>
<td>Woman</td>
<td>3</td>
<td>PT-35</td>
<td>Man</td>
<td>3</td>
</tr>
<tr>
<td>PT-8</td>
<td>Man</td>
<td>1</td>
<td>PT-22</td>
<td>Woman</td>
<td>3</td>
<td>PT-36</td>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>PT-9</td>
<td>Man</td>
<td>1</td>
<td>PT-23</td>
<td>Man</td>
<td>3</td>
<td>PT-37</td>
<td>Man</td>
<td>3</td>
</tr>
<tr>
<td>PT-10</td>
<td>Woman</td>
<td>1</td>
<td>PT-24</td>
<td>Woman</td>
<td>3</td>
<td>PT-38</td>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>PT-11</td>
<td>Woman</td>
<td>1</td>
<td>PT-25</td>
<td>Man</td>
<td>3</td>
<td>PT-39</td>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>PT-12</td>
<td>Woman</td>
<td>1</td>
<td>PT-26</td>
<td>Woman</td>
<td>3</td>
<td>PT-40</td>
<td>Man</td>
<td>3</td>
</tr>
<tr>
<td>PT-13</td>
<td>Woman</td>
<td>1</td>
<td>PT-27</td>
<td>Man</td>
<td>3</td>
<td>PT-41</td>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>PT-14</td>
<td>Woman</td>
<td>1</td>
<td>PT-28</td>
<td>Man</td>
<td>3</td>
<td>PT-42</td>
<td>Woman</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data Collection Tool and Data Collection Process**

A semi-structured interview form consisting of five open-ended questions was used as a data collection tool in the research. The questions prepared in line with the purpose of the research were evaluated by two field and one language experts, and the interview form took its final form in line
with the opinions of field experts. The questions in the semi-structured interview form are listed below:

- *How do you think that changing work styles (flexible working, remote working, work from home/Home Office/Home based business-work from home, etc.) will affect people’s work lives with the effects of digitalization?*

- *Can high technologies (artificial intelligence, robot technologies, intelligent systems, etc.) which are human products limit the functions of people in society?*

- *In your opinion, what are the expectations from school administrators in the period of Society 5.0?*

- *In your opinion, what are the changing roles of school administrators in the Society 5.0 period?*

- *How can organizational balance be achieved in educational organizations in the transformation to human-technology-based societies with Society 5.0?*

Data were collected during extracurricular times via “Google Docs” on a voluntary basis with the teacher candidates who were in the study group. The data in text form were combined into a single file and a 104 page data file was obtained in line with the responses.

**Data Analysis**

Data were analysed by using the “inductive thematic analysis” method. Thematic analysis, which is a method used to define and analyse the themes of the obtained data, is a data strategy that allows the data to be explained at the smallest level (Braun & Clarke, 2006). In this context, data analysis was carried out in six stages (Braun & Clarke, 2006). These stages are given in Figure 4.

![Figure 4. Stages Followed in the Data Analysis Process](image-url)

In accordance with the analysis stages in Figure 4, the text files obtained from the interview forms at the beginning of the analysis process were coded separately for each teacher candidate by the researchers. The coding structured as “PT-G/2” format, including the pre-service teacher (PT), interview order and gender (G). The data were read by the researchers in the first stage. Thus, it was ensured that the researchers became familiar with the data. In the second stage, the first coding was revealed in line with the data. After the codes were obtained, the categories and themes related to the codes were determined in the third stage. The categories and themes obtained in the fourth stage were
reviewed and the codes, categories and themes obtained were reviewed in terms of suitability. The determined codes, categories and themes were checked again by two researchers. The themes obtained in the fifth stage were named, and after the themes were finalized, in the final and sixth stage, the reporting of the data, was started. In reporting, codes, categories and themes were visualized and revealed. Frequency values of codes are also included in these images. The views of the pre-service teachers are also included in direct quotations. The reliability rate of the research was calculated as 89.2% by using the formula “Percent of Consensus = Consensus / (Agreement + Disagreement) x 100” put forward by Miles and Huberman (1994). Miles and Huberman (1994) agree that the reliability rate calculated over 80% is sufficient; Yıldırım and Şimşek (2016) accept a reliability rate of 70% and above as sufficient. In this context, it is seen that the reliability ratio obtained meets the reliability condition.

FINDINGS

Findings on the Impacts of Digitalization on Business Life

“How do you think the changing work styles (flexible working, remote working, work from home/Home Office/Home-based business-work from home, etc.) will affect people’s work lives?” was asked to prospective teachers in order to reveal the effects of digitalization on business life. Information on the categories, codes and frequency values of the codes obtained as a result of the analysis made in line with the answers they gave to the question is given in Figure 5.

![Figure 5. Opinions of Teacher Candidates on the Subject of Work Life](image)

When Figure 5 is analysed, it is seen that the opinions of the pre-service teachers were evaluated under the theme of “Work Life” and this theme consisted of two categories as positive and negative impact. When the codes in the Positive Impact category are examined, these codes are “reducing time losses (f=24)”, “saving resources (f=19)”, “increasing working efficiency (f=17)”, “flexible working (f=16)”. It has been stated that the most expressed positive effect of digitalization on business life is to reduce time losses. PT-M/3 thinks of this code as “...people avoid the loss of time they would experience especially in transportation with the ease brought by digitalization.”. PT-W/2’s opinion on other codes is “For employees, there is less time lost in traffic and therefore less stress. If the process can be managed correctly, productivity increase and resource savings can be achieved”. PT-W/37 thinks “They will be able to do their work from where they are without the need to go to the workplace by trying to have the features that can use technology well. They can adopt a more flexible working method in their work”. PT-M/40 “…first of all, since the employees will not come to work, they will not have road problems. Employees are sleep deprived since they get up very early in the pre-road preparation phase, and most of the time, the person cannot meet their basic needs such as eating and taking a shower in a short time. This situation adversely affects the working
performance. With business forms such as remote working, employees get a chance to sleep a little longer and start the shift rested, so they are not road tired. We can say that this situation actually reduces work-related excuses (my child got sick, there was an accident on the road, I was very sick, I was late, there was traffic, etc.). At the same time, it is one of the advantageous situations for managers, and it also reduces the in-office costs caused by employees (tea, coffee, electricity, water, food, etc.)."

When we look at the codes in the negative impact category, “inability to focus (f=13)”, “loss of motivation (f=11)”, “poor performance (f=11)”, “inefficient work (9)”, decreased communication (f=7”), “antisocialization (f=5)”, “untimely working (f=4)”, “increased workload (f=2)”, “mixing of work and private life (f=2)”. Regarding the code of not being able to focus, PT-M/23 “…distraction may occur after a certain period of time with the comfort of being at home in works carried out on the internet and in computer environment. In this case, serious problems may occur in focusing…” When we look at the exemplary opinions about the other codes, PT-W/43 “On the other hand, the state of being social, which is the characteristic of human existence, will also weaken. Because people need socialization. Socialization will decrease as robots start working everywhere. The gathering of people will decrease.”; PT-M/40 “…I think that people are not sufficiently motivated in their remote processes.”; PT-M/36 “…the fact that technology has changed business structures has negatively affected people. The reason is that the home environment accustoms people to comfort.”; PT-W/17 “…..changing work conditions and working styles such as flexible working and remote working have increased the comfort level of people. Since there are no collective working areas, people’s motivation may be lost. Due to this, work efficiency may decrease and productivity may decrease.”.

**Findings Obtained on Human Functions in the Digital World**

In order to determine the limiting effect of the digital world on people’s functions, the categories, codes and information on the frequency values of the codes obtained as a result of the analysis given in line with the answers to the question "Can human-made high technologies (artificial intelligence, robotic technologies, intelligent systems, etc.) limit the functions of people in society?" are included in Figure 6.

![Figure 6. Teacher Candidates Views on Functions Theme](image)

When Figure 6 is examined, it is seen that the theme of "Functions" consists of one category, the limiting effect.

The codes formed in the limiting effect category were "feeling of inadequacy(f=24)", "machine/robot preference instead of manpower (f=22)", "compliance problem (f=16)", "digital fatigue (f=11)" and "inequality of opportunity (f=6)". When looking at the exemplary opinions regarding the code of inadequacy, PT-M/27 "... High technologies that are human products can limit people’s function in society. The reason is that machines can do much more in a short time than humans can. In this case, people may have difficulty competing with machines and may not consider themselves sufficient to do business" while PT-W/29 expressed her opinion on machine/robot
preference code instead of manpower as "... Technological products in all areas actually reduce the need for people. The use of machines that are faster than humans, tireless machines, can at some point cause people to no longer be needed in some business areas.". PT-W/33 said that her idea was "... Our attempt at the age of digital transformation has been so rapid and radical that we have no opportunity to see what is facing extinction in society. For example, while buses used to have assistants collecting bus fares, now public transport cards, which we call kentkart, have replaced assistants by improving their infrastructure. In this regard, we can say that digital developments limit human function."

Findings on the Changing Roles of Managers in Society 5.0 Period

In order to determine the changing managerial roles in the Society 5.0 period, the categories, codes and information on the frequency values of the codes obtained as a result of the analysis made in line with the answers given to the question "What are the changing roles of managers in the Society 5.0 period in your opinion?" are included in Figure 7.

When Figure 7 is analysed, three categories are created under the theme of "Changing Roles of Managers"; organizational person size, organizational development dimension and organizational decision size.

The codes generated in the organization-person size category were "strong communication (f=19)", "interaction (f=15)", "expanding networks (f=7)". PT-M/2 "... managers should keep communication as high as possible in working environments where the effects of technology are felt very highly. Because I think that communication is an indispensable competence due to the social structure of the person, no matter where the technology comes from."

The codes generated in the development dimension category were "digital team leadership (f=14)", "ensuring digital security (f=13)", "building digital teams (f=12)", “visionary gaze (f=9)", “mentoring (f=10)", “agility (f=6)". Regarding the digital team leadership code, PT-W/49 expressed his as opinion "... In the age of digital transformation, having a certain knowledge is not considered sufficient. Therefore, administrators should also be able to be leaders in online environments...". Regarding mentoring, PT-W/11 "... in organizations where technology is used intensively, managers should be able to guide their employees on issues such as motivation, compliance, and information provision..." she has expressed his opinion. Regarding the code for ensuring digital security, PT-W/10 "... The biggest problem in digital environment is software hackers and malicious spies. It will be up to the managers to prevent this." PT-M/31 expressed as his opinion "... People living in a society with a
The community 5.0 model will expect senior executive skills and functions from their managers. Because the use of technology, artificial intelligence and digitalization in all areas of life with human intelligence and capabilities will also make it difficult to manage society and organizational structures in society. With the increase of digitalization, security risks and privacy issues will increase even more. Managers are expected to find solutions to these problems..."

It was observed that the codes formed in organizational decision size were "flexibility (f=12)"", "risk analysis (f=9)". PT-W/12 "... managers do not act with strict stereotypes when performing their duties in such a rapid change process, and they can succeed if they can be flexible in carrying out changes..."

**Findings on Society’s Expectations from Managers in The Period 5.0**

In order to determine the expectations of the society from the managers in the period of Society 5.0, the teacher candidates were asked the question "What are the expectations of the society from the managers in the period of Society 5.0?".

![Figure 8. Teacher Candidates’ Opinions on Expectations from Managers](image)

When Figure 8 is analysed, it is seen that the theme of "Expectations from Managers" consists of four categories: personal characteristics, management processes, digital competencies and interpersonal connections.

It was observed that the codes formed in the personal characteristics category were "critical thinking (f=11)"", "questioning thinking (f=9)"", "openness to change (f=7)". Regarding the code of openness to change, was the idea of PT-W/14 "... especially the effect of managers in such periods is even more pronounced. Therefore, innovative managers with developed mindsets enable their institutions to adapt faster in technological transformations..."

It was observed that the codes formed in the management processes category were "quick decision-making (f=17)"", "taking initiative (f=14)"", "joint decision (f=12)"", "information flow (f=10)"", "online behavior management (f=6)".

The codes formed in the digital competencies category were "digital literacy (f=21)"", "data sharing (f=19)"", "artificial intelligence (f=17)". Regarding the digital literacy code, PT-M/5 "Human-technology should gain the digital literacy skills of individuals in the transition to societies." PT-W/18 is "... the competence of administrators in artificial intelligence, data storage, data delivery is very important for management forces..."
The codes generated in the interpersonal connection category were found to be "accessibility (f=27)", "communication (f=18)", "online collaboration (f=15)", "conciliatory (f=11)". The idea of PT-W/45 "... I think it is even more important in digital environments to communicate, to reach the person we want at any time..."

**Findings on Achieving Organizational Balance in Transformation with Society 5.0**

In order to reveal the requirements for achieving organizational balance in the social transformation with Society 5.0, the categories, codes and information on the frequency values of the codes obtained as a result of the analysis given in line with the answers given to the question "How can organizational balance be achieved in the transformation of society 5.0 to human-technology-based societies?" are included in Figure 9.

![Figure 9. Teacher Candidates Views on Organizational Balance Theme](image)

When Figure 9 is analysed, it is seen that the theme of "Organizational Balance" consists of two categories; organizational change and organizational development.

It was observed that the codes formed in the category of organizational change were "solution to barriers to resistance to change (f=19)", "openness to change (f=15)", "organizational agility (f=11)", "social expectations (f=5)". PT-W/6 considers the code of openness and social expectations for change "... First of all, in order to achieve organizational balance, people need to follow innovations and know how to use technology. Therefore, it may be beneficial for managers to meet the needs of the society and to show flexibility when necessary in order to achieve organizational balance..."; PT-M/44 thought "... people and technology interact in a unique way. In this context, it is critical to achieve an organizational balance between human and technology. In order to maintain organizational balance, it is of capital importance that societies keep up with change and technological developments. Since if you resist or cannot keep up with the changes, the balance may be disturbed.". In addition, PT-W/7 "... People need to be open to change in technology in order to achieve organizational balance. People who are away from technological developments can disturb the organizational balance between technology and man...".

The codes formed in the category of organizational development were "improving leadership skills (f=24)", "interpersonal cohesion (f=18)", "increasing employee quality (f=14)", "creating a conciliatory culture (f=11)". Regarding the improving leadership skills PT-M/35 "...I think leadership behaviors are very important in environments where change is necessary and rapid. For this reason, the efforts of leaders to ensure harmony between technology and people will need leadership skills in the digital environment.", and regarding the increasing employee PT-W/11 "...I think that being able to follow technology is necessary for every employee. Because technology competence provides professional development.".
DISCUSSION AND CONCLUSION

In line with the rapid developments in information communication technologies, the question of how the management of educational organizations open to the impact of these developments should change comes to the fore. Managers who can successfully adapt to digital processes will ensure the continuity of organizations. It is known that technological developments have established the basis for radical changes in societies. Today, with the Covid-19 global pandemic, radical changes in education have occurred, and in 2020, education was completely digital in most countries. With this effect in 2020, it is predicted that digitalization in education will become more widespread and concepts such as remote working, artificial intelligence, cloud computing, internet of things will be more central in education. Since managers are in a position to form the starting point for digital transformation in education, it is important that they are aware of the roles they will take on, that they can analyse community expectations and develop a strategy to effectively carry out management processes. When the results are evaluated in line with the findings obtained from the study, it is possible that there is a multifaceted impact on society, including in business life, with human technology integration, society 5.0 increasing the prevalence of technology.

Granrath (2017) is community 5.0 has changed many areas while Puncreobutr (2016) has stated that people’s work and social lives have also changed during the transformation process. Especially in open systems, environmental and organizational interaction continues (Sabuncuoglu & Tüz, 2016). Schools with open systems are also directly affected by the changes brought about by digital transformation.

With digital transformation, business lives are changing and concepts such as working from home come to the fore. Due to the global pandemic affecting the whole world, working remotely/ from home has been the way it works for all organizations, especially in 2020 (ILO, 2020). In the researches, working remotely/ from home was among the thoughts expressed as having positive and negative effects (Acar & Acar, 2019). Positive aspects include cost reduction, saving time, increasing motivation, being able to spend more time with families (Akça & Tepe Kaucukoglu; Aydin Goktepe, 2020; Kavi & Koçak, 2010); negative aspects include loneliness, inability to socialize, destabilization of work and home life, the emergence of technical problems, stress (Akça & Tepe Kaucukoglu, 2020). Similarly, the results obtained from the research revealed the positive and negative effects of Society 5.0 on the way they work. According to these results, it has been concluded that changing business conditions with technological developments in business life with Society 5.0 can negatively affect people as well as positively. When looking at the positive effects, the effects such as the possibility of flexible working and the saving of time and resources spent going to work were expressed as a priority. When negative effects were evaluated, negative effects such as inability to focus, reducing motivation, and mixing work and private living space were among the priority outcomes of technology and business integration.

Digital transformation is not limited to mechanical structures, and it is necessary to consider that digital transformation has social effects with information sharing and collaborative approach in order to be successful in terms of adapting to digital processes (Gözüküçük, 2020; Stolterman & Fors, 2004). Similarly, Frankiewicz and Chamorro-Premuzic (2020) emphasized that human beings are at the heart of digital transformation. In this respect, the level of development of people is more important than the level of mechanical development in the digital transformation process.

Another conclusion from the research was that it was thought that high technologies could limit people’s function by reducing the need for people. With the integration of new technologies into institutions, the formation of digital teams has been an issue that has been raised for institutions (Chutnik & Grzesik, 2009; Parker, 2007). Digital teams enable the use of team members’ information communication technologies through digital tools without being bound by certain limits (Peters & Manz, 2007). The ability of managers to manage digital teams positively or negatively affects the output of organizations. Therefore, it can be said that the ability of managers to manage these teams correctly is related to the managerial effectiveness of the managers. Berry says (2011) the managerial
success or failure of digital teams has been attributed to poor leadership qualifications of managers. In this context, it is possible to say that managerial effectiveness and managers’ digital leadership competencies are important in digital environments. Similarly, the ability to build digital teams, as obtained in the research, was among the prominent roles of managers in the Society 5.0 period. When looking at other roles, roles such as expanding networks, enabling interaction, digital team leadership, and ensuring digital security have come to the fore. Information obtained through each device used in digital media is stored (Doğan & Arslantekin, 2016). Therefore, we face the question of securing both personal and organization data in digital environments. As stated in the Ministry of National Education 2023 Vision Document, it is planned to move to a data-based management system in schools (MEB, 2018). Therefore, since the prevalence of digital media brought about by digital transformation brings with it digital risks, ensuring digital security in environments where management processes are data-based is seen as one of the important areas of responsibility of managers.

Although it is seen that expectations differ with digital transformation when looking at the expectations of the society from managers, these expectations include digital literacy, data sharing, taking initiative, accessibility, online collaboration, online behavior management, and providing critical and questioning thinking competence. Technology size has been one of the focuses of school administrators’ management processes (Anderson & Dexter, 2005). In this respect, technological developments and changes also alter the roles and responsibilities of school leaders. This idea was supported by the results of the research.

In order for organizations to adapt to these changes in the process of rapid change and therefore to maintain organizational balance, it has been concluded that it is important to create an agile organizational structure, to create a conciliatory culture, to increase leadership skills, to eliminate barriers of resistance to change. Frankiewicz and ChamorroPremuzic (2020) have demonstrated that the process of change must start from managers. In this respect, the importance of the role of managers in the process is undeniable. Deshpande (2018) has demonstrated that the adoption of new technologies is not considered important enough among the obstacles that exist in the realization of digital transformation. Adapting to change is especially important in critical institutions that affect long-term outcomes such as education and community development. With the adaptation to change and the reduction of the effects of entropy in organizational structures, the existence of a threatening effect for the balance of the organization will be eliminated. As stated by Sackmann, Eggenhofer-Rehart and Friesl (2009), it is seen as important for organizations to adapt to change by identifying their needs for change.

Suggestions

In the context of the results reached by the research, the following recommendations can be presented;

- In educational institutions where the effects of technology are felt at a high level, managers have a high level of responsibility to coordinate processes. Therefore, managers should increase the capacity of their employees to adapt to change. In these processes, managers should be in an easily accessible position by all employees.

- Digital literacy is among the basic competencies in the digital world. Therefore, since digital literacy is seen as a critical starting point for the start of the digital transformation process, managers should be able to bring their digital literacy qualifications to the desired level. Then, managers should pay attention to increasing the digital literacy competence of all stakeholders by influencing their institutions.

- Managers’ level of competence should be increased in digital leadership, the ability to build and manage digital teams, and online behavior management.
• In the process of digital transformation, it is important that managers prevent elements that can have devastating effects for organizational balance in order to prevent entropy in organizations. Therefore, managers should also actively adopt management processes in digital processes.

• Managers should enable employees in all decision-making processes.

• The social effects of digital transformation should be analysed and necessary developer or remedial measures should be taken by the administrators in order to resolve these effects.

REFERENCES


Schreckling, E. & Steiger, C. (2017). Digitalize or drown. In G. Oswald and M. Kleinemeier (Eds.) Shaping the digital enterprise (pp. 3-27), Waldorf: Springer.


Investigation of Pedagogical Belief Systems and Teacher Efficacy of Teachers in Turkey

Derya Yüreğilli Göksu
Ministry of National Education

Volkan Duran
Iğdır University

Abstract

Pedagogical belief systems and the teacher efficacy could be used as a key concept to evaluate the teacher’s pedagogical background. Therefore, this study aims to examine pedagogical belief systems and the teacher efficacy of teachers, especially in science and art centers (BİLSEM). The sample of the study consists of 388 teachers were selected by convenience sampling method. The findings of the study show that the gender and experience variables don’t make any significant difference in teacher’s pedagogical belief systems and teacher efficacy. Besides affiliation variable makes a significant difference in teacher’s pedagogical belief systems but make no significant difference in their teacher efficacy except for their teaching skills. Independent variable importance analysis shows that affiliation is the most important factor for pedagogical belief systems in comparison to experience and gender dimensions. Independent variable importance analysis shows that experience is the most important factor for teacher efficacy in comparison to experience and gender dimensions. Independent variable importance shows that the most important factor is the guidance for sub-dimensions of teacher efficacy in terms of neural networks for explaining pedagogical belief systems. The second one is the assessment and evaluation and motivation. Moreover, all the sub-dimensions of the learner-centered approach are in low level positive significant correlations with the pedagogical belief systems. But no correlation is found with the teacher-centered approach except assessment and evaluation dimension. According to the findings, the learner-centered approach is the most important dimension of pedagogical belief systems in terms of neural networks for explaining teacher efficacy. Therefore a new model was created based on this fact so that path analysis results show that there is a causal connection from learner-centered approach to guidance, behavioral-instructional-management, motivation, and teaching skills dimensions to some extend.

Keywords: Pedagogical Belief Systems, Teacher Efficacy, Teachers working in BİLSEM, Special Education

DOI: 10.29329/ijpe.2022.426.27
1. INTRODUCTION

Teachers' ability to serve their responsibilities well with their students in the classroom is all about their beliefs about their career and position in the classroom, their students, themselves, and how a person should be raised. Assessing the self-perception of teachers' capacity is a significant element in evaluating the quality of education as well as the quality of the curricula. It can be concluded that education is realized by the skill and competence level of the instructor. Therefore, two factors that can be regarded as the dimensions affecting this perception can be given as teacher self-efficacy and teacher pedagogical belief systems (Atıcı, 2001: 196).

Efficacy is the level to which teachers feel they have the capacity to improve students' progress (Ashton, 1984:28). Pajares (1995:3) claimed that the notion of efficacy has three impacts on human's actions:

1. It affects the choice of behavior people seem to choose activities on which they are knowledgeable and optimistic about. It also affects the choice of them on which they dislike tasks that they are anxious and concerned about.

2. Self-efficacy beliefs describe the level of internal assurance the person has. High efficacy means greater commitment and persistence.

3. A person's belief has a huge effect on one's emotions and thoughts. Low efficacy people feel that the activities are more complicated to accomplish than they are.

The first research studies conducted regarding teacher efficacy were based on Rotter’s Social Learning Theory (Tschannen-Moran and Hoy, 2001). Then Bandura (1997) claimed that there is a distinction between self-efficacy and self-esteem. Perceived self-efficacy is the belief in one's capability, while self-esteem reflects one's positive opinions of oneself. Bandura (1997) proposed that the "agency" is the action performed deliberately. Personal efficacy beliefs form an essential aspect of human agency. When people do not trust in their abilities to do anything, they do not attempt to realize it. However, as mentioned by Labone (2004), Bandura's self-efficacy paradigm lacks the understanding of teachers' daily activities. Tschannen-Moran, Woolfolk Hoy and Hoy (1998: 233) presented a model that addressed teachers' self-efficacy in this respect. Accordingly, teacher efficacy is described as the teachers' capacity to coordinate and perform acts of a specific teaching activity in a particular sense. Moreover, Tschannen-Moran and Woolfolk Hoy (2001) developed the Teachers’ Sense of Efficacy Scale (TSES) where they determined three levels of teacher efficacy as student engagement, instructional behaviors, and classroom management. Today, teacher efficacy is regarded as an important idea with significant implications for evaluating many educational outcomes such as achievement, motivation, the behavior of teachers in classroom management. Tschannen-Moran and Woolfok Hoy (2001) emphasized that there is a clear association between instructor efficacy and different educational outcomes including teacher persistence, motivation, dedication, and instructional actions along with the student outcomes like success, inspiration, and self-efficacy beliefs. Erawan (2011) also indicated that instructor efficacy refers to the teacher's awareness, abilities, and attitudes as the key to effective teaching. Therefore, teachers' confidence and self-efficacy have gained an increasingly significant role in educational psychology research since its implications for teaching effectiveness, instructional practices, and students' academic achievement (Klassen and Tze, 2014). Accordingly, it is important to investigate teacher efficacy in terms of different variables to better understand or at least conceptualize the important factors and relations with teacher efficacy and other cognitive elements in the educational process.

Another important factor that can be related to effective teaching is the pedagogical belief systems of teachers. It is defined as all the beliefs of teachers about learning and teaching (Doğan, 2013: 6). As Bandura (1997) argued, our minds are shaped much more by assumptions than by reality. Teachers have started to embrace certain pedagogical belief systems before they start their education profession and they engage in teacher certification processes with these teacher models (Clark, 1988: 210).
7; Soysal, Radmard and Kutluca, 2018). Miheala and Oana (2014) stated that the belief systems of teachers are the preconditions of teachers’ behavior patterns and classroom motives. Turner et al. (2009) stressed that belief has an impact on the behavior of teachers and should therefore be considered because it fosters the learning of students. Smith (2005) stated that teachers have cognitive filters regarding teachers' pedagogical beliefs so that they anticipated how they would act in the face of events and problems. According to Vartuli and Rohs (2009), teachers' values can easily inculcate their educational activities on abrupt occasions. In reality, teachers frequently rely on their personal biases, first impressions, and some long-held beliefs as they perform daily tasks for the task. Teacher beliefs affect participation by framing and guiding practice, teaching participants what is important, and providing learning opportunities. Therefore this research was conducted because beliefs are fundamental parts of understanding who the teachers are and what their duties are (Gill and Fives, 2015).

Knowing what is happening in the world of thoughts of teachers during the teaching process will be effective in forming the basis of qualified and quality education (Gill and Fives, 2015). In educational contexts, teachers' self-efficacy may be better conceptualized in terms of their beliefs in the capacity to plan, coordinate, and carry out tasks necessary to achieve educational objectives (Skaalvik & Skaalvik, 2010). Pedagogical Belief Systems And The Teacher Efficacy are important concepts for teaching and training practices since they are effecting the efficacy of these processes. Although in the literature, experimental studies as well as action studies seem to be more valuable with respect to quantitative studies, the results of quantitative studies can give more grounded insights especially for meta-analysis and meta-synthesis studies to make more generalizations. Qualitative studies are important because they give snapshots in terms of specific characteristics to enable researchers to comprehend the dynamic nature of the puzzle of education practice. Therefore, in this respect, it is thought that pedagogical belief systems and their teacher efficacy are conceptually similar topics in terms of sharing pedagogical beliefs, so that, pedagogical belief systems and their teacher efficacy could be used as key concepts to understand the teachers’ pedagogical background. Therefore in this study, we seek the answers to the following questions given below:

1- Is there any significant difference between teachers' pedagogical belief systems and teacher efficacy in terms of their gender?

2- Is there any significant difference between teachers' pedagogical belief systems and teacher efficacy in terms of their experience?

3- Is there any significant difference between teachers' pedagogical belief systems and teacher efficacy in terms of their affiliation?

4- Which is the most important factor among the variables of affiliation, experience, and gender in terms of neural networks for explaining teachers' pedagogical belief systems and teacher efficacy?

5- Which is the most important factor among the sub-dimensions of teacher efficacy in terms of neural networks for explaining pedagogical belief systems?

6- What are the correlations among the sub-dimensions of teacher efficacy?

2. METHOD

In this study, "correlational survey model" was used to determine the relationship between teacher efficacy and pedagogical belief systems. “Correlational survey model” aims to determine the existence or level of co-change between variables for the situation where there are at least two independent variables (Karasar, 1999: 81). This model tries to determine not the causes of the events, but the situations they are in, their characteristics, and the relationship between them (Kaptan, 1998: 53). The sample of the study consists of 388 teachers randomly selected from the population. The
A simple random sampling method was used to determine the sample of the study. In this sampling, when selecting each unit in the universe population, the neutrality rule prevails because of the possibility of being equal and independent (Balcı, 2001: 95). The study aims mainly at gifted students. Therefore teachers in science and art centers (BILSEM) are selected for the major part of the sample. Gifted and talented children need help in pre-school, primary, secondary, and high schools as well. Science and art centers are educational centers that are founded to support the unique educating needs of the students who are gifted, talented, and eligible in the pre-school and secondary schools by the General Directorate of Special Education and Guidance Services, Ministry of Education in Turkey (Donmez 2004: 72). If a student shows the characteristics of a gifted and talented person, a primary school teacher recommends him or her for the science and art center to apply for the special talent test. Next, the committed students conduct a group screening evaluation. Person assessment is expected of students who pass this community screening level. Students that fulfill these processes are eligible for science and art centers (Baykoç-Dönmez, 2014). Science and art center teachers are also evaluated and taken to the centers based on particular standards. So understanding teachers in science and art centers need to provide better educational opportunities for gifted students.

A random sampling of the variables involves completing a questionnaire centering on the variables of the topic the researcher is interested in. Additionally, for correlational survey models, the number sample size is taken into consideration as a result of the calculation made with the following formula (Tabachnick and Fidell, 2007):

\[ N > 50 + 8m \]

Where: N: Number of participants m: number of independent variables where m= 7 (5 independent variables from teacher efficacy, 2 from pedagogical belief systems, 3 from demographic variables)

\[ N > 130 \] where the target sample size for this study is 388 which meets the requirement.

| Table 2.1. The descriptive results of the sample of the research |

<table>
<thead>
<tr>
<th>Affiliation * Gender Crosstabulation</th>
<th>Gender</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>26</td>
<td>43</td>
</tr>
<tr>
<td>Affiliation</td>
<td>17</td>
<td>59</td>
<td>103</td>
</tr>
<tr>
<td>Primary School</td>
<td>27</td>
<td>89</td>
<td>183</td>
</tr>
<tr>
<td>Secondary School</td>
<td>32</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science and art centers</td>
<td>32</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>187</td>
<td>388</td>
</tr>
</tbody>
</table>

Measurement tools of this study are ‘Ohio Teacher-Efficacy Scale’ and ‘Pedagogical Belief Systems Scale’. Moreover, the ‘Ohio Teacher-Efficacy Scale’ was applied to evaluate the efficiency of the teachers. This scale was first improved by Tschannen-Moran and Woolfolk-Hoy (2001) and it was adapted into Turkish by Baloğlu and Karadağ (2008). ‘Ohio Teacher-Efficacy Scale’ is made up of sub-dimensions of ‘behavioral management’, ‘motivation’, ‘guidance’, ‘teaching skills’, and ‘assessment and evaluation’. The pedagogical Belief Systems Scale was developed by Chan (2001), whose validity and reliability studies were performed by Soysal, Radmard, and Kutluca (2018), which Chan, Tan, and Khoo (2007) gave their final form was used in this study. Cronbach alpha internal consistency coefficient was found to be 0.77 for the Turkish adapted version of this scale by Soysal, Radmard, and Kutluca (2018). Neural networks are the preferred tool for many predictive data mining applications because of their power, flexibility, and ease of use and it can be used a wide range of statistical models since its minimal demands on model structure and assumptions. Therefore, because our variables are quantitative one, we conclude that it is better to use neural networks in this study.

1 https://www.sussex.ac.uk/its/pdfs/SPSS_Neural_Network_22.pdf retrieved from 17.09.2021
3. Limitation of the Study

The first limitation of this study is the population which is limited by the Central Anatolia Region. The second limitation is indeed measurement tools and their theoretical basis. Thirdly, and most importantly, the main limitation of this study is the analysis methods. Since the data is not normally distributed according to Kolmorov-Smirnov and Shapiro-Wilk tests, Mann-Whitney U, Kruskal Wallis were used in this study because it is based on quantitative data. Neural network analysis were also used in this study.

Table 3.1. Tests of normality

<table>
<thead>
<tr>
<th>Tests of Normality</th>
<th>Kolmogorov-Smirnov*</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learnercentered</td>
<td>.178</td>
<td>.00</td>
</tr>
<tr>
<td>Teachercentered</td>
<td>.095</td>
<td>.00</td>
</tr>
<tr>
<td>Guidance</td>
<td>.109</td>
<td>.00</td>
</tr>
<tr>
<td>Behavioral instructional management</td>
<td>.103</td>
<td>.00</td>
</tr>
<tr>
<td>Motivation</td>
<td>.103</td>
<td>.00</td>
</tr>
<tr>
<td>Teaching skills</td>
<td>.103</td>
<td>.00</td>
</tr>
<tr>
<td>assessment-evaluation</td>
<td>.176</td>
<td>.00</td>
</tr>
</tbody>
</table>

a. Lilliefors Significance Correction

4. FINDINGS

4.1. First finding for the question as “Is there any significant difference between teachers pedagogical belief systems and teacher efficacy in terms of their gender?”

The first finding for the question as “Is there any significant difference between teachers pedagogical belief systems and teacher efficacy in terms of their gender?” shows that the gender variable doesn’t make any significant difference between teacher’s pedagogical belief systems and their teacher efficacy.

Table 4.1. Mann-Whitney U test statistics in terms of gender

<table>
<thead>
<tr>
<th>Test Statistics</th>
<th>learner-centered</th>
<th>teacher-centered</th>
<th>Guidance</th>
<th>behavioural-instructional management</th>
<th>motivation</th>
<th>teaching skills</th>
<th>assessment-evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>16874,000</td>
<td>17231,000</td>
<td>18248,000</td>
<td>18466,000</td>
<td>18286,000</td>
<td>18728,000</td>
<td>18525,000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>34452,000</td>
<td>37532,000</td>
<td>35826,000</td>
<td>36044,000</td>
<td>35864,000</td>
<td>36306,000</td>
<td>36103,000</td>
</tr>
<tr>
<td>Z</td>
<td>-1.751</td>
<td>-1.417</td>
<td>-4.97</td>
<td>-2.99</td>
<td>-4.63</td>
<td>-0.59</td>
<td>-2.50</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.080</td>
<td>.157</td>
<td>.619</td>
<td>.765</td>
<td>.643</td>
<td>.953</td>
<td>.802</td>
</tr>
</tbody>
</table>

a. Grouping Variable: Gender

4.2. Second finding for the question as “Is there any significant difference between teachers' pedagogical belief systems and teacher efficacy in terms of their experience?”

The first finding for the question as “Is there any significant difference between teachers pedagogical belief systems and teacher efficacy in terms of their experience?” shows that the experience variable doesn’t make any significant difference on teacher’s pedagogical belief systems and teacher efficacy.
Table 4.2. Kruskal Wallis Test statistics in terms of experience

<table>
<thead>
<tr>
<th>Test Statistics&lt;sup&gt;a,b&lt;/sup&gt;</th>
<th>learner-centered</th>
<th>teacher-centered</th>
<th>guidance</th>
<th>behavioural-instructional</th>
<th>management</th>
<th>motivation</th>
<th>teaching skills</th>
<th>assessment</th>
<th>evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>10,267</td>
<td>6,844</td>
<td>2,813</td>
<td>1.620</td>
<td>5,607</td>
<td>1.884</td>
<td>9.581</td>
<td></td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.114</td>
<td>.335</td>
<td>.832</td>
<td>.951</td>
<td>.469</td>
<td>.930</td>
<td>.143</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Kruskal Wallis Test  
<sup>b</sup> Grouping Variable: Experience

Figure 4.1. Implications of no significant difference in terms of job experience

4.3. Third finding for the question as “Is there any significant difference between teachers pedagogical belief systems and teacher efficacy in terms of their affiliation?”

The first finding for the question as “Is there any significant difference between teachers pedagogical belief systems and teacher efficacy in terms of their affiliation?” show that the affiliation variable makes a significant difference in teacher’s pedagogical belief systems but make no significant difference in their teacher efficacy except for their teaching skills.

Table 4.3. Kruskal Wallis Test statistics in terms of affiliation

<table>
<thead>
<tr>
<th>Learner-centered</th>
<th>teacher-centered</th>
<th>guidance</th>
<th>Test Statistics&lt;sup&gt;a,b&lt;/sup&gt;</th>
<th>behavioural-instructional</th>
<th>management</th>
<th>motivation</th>
<th>teaching skills</th>
<th>assessment</th>
<th>evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>8,066</td>
<td>30,520</td>
<td>5.021</td>
<td>1.326</td>
<td>3.355</td>
<td>9.466</td>
<td>2.439</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Df</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.045</td>
<td>.000</td>
<td>.170</td>
<td>.723</td>
<td>.340</td>
<td>.024</td>
<td>.486</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Kruskal Wallis Test  
<sup>b</sup> Grouping Variable: Affiliation

When the source of the significant difference in teacher’s pedagogical belief systems is investigated, the learner-centered approach is mostly adopted by primary school teachers, and compared to primary school teachers secondary school and science and art centers teachers have less mean rank in this respect. In terms of the teacher-centered approach, the highest mean rank belongs to secondary school teachers whereas the lowest value belongs to science and art centers teachers.
Table 4.4. The mean rank values of teachers in terms of their “Pedagogical Belief Systems”

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-centered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary school</td>
<td>43</td>
<td>239.86</td>
</tr>
<tr>
<td>secondary school</td>
<td>103</td>
<td>188.12</td>
</tr>
<tr>
<td>high school</td>
<td>59</td>
<td>191.74</td>
</tr>
<tr>
<td>science and art centers</td>
<td>183</td>
<td>188.32</td>
</tr>
<tr>
<td>Total</td>
<td>388</td>
<td></td>
</tr>
<tr>
<td>Teacher-centered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary school</td>
<td>43</td>
<td>200.65</td>
</tr>
<tr>
<td>secondary school</td>
<td>103</td>
<td>239.19</td>
</tr>
<tr>
<td>high school</td>
<td>59</td>
<td>206.01</td>
</tr>
<tr>
<td>science and art centers</td>
<td>183</td>
<td>164.19</td>
</tr>
<tr>
<td>Total</td>
<td>388</td>
<td></td>
</tr>
</tbody>
</table>

When the source of the significant difference in teaching skills dimensions in the teacher efficacy scale, the highest mean rank belongs to science and art center teachers whereas the lowest mean rank secondary school teachers.

Table 4.5. The mean rank values of teachers in terms of teacher efficacy

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary school</td>
<td>43</td>
<td>182.07</td>
</tr>
<tr>
<td>secondary school</td>
<td>103</td>
<td>169.91</td>
</tr>
<tr>
<td>high school</td>
<td>59</td>
<td>196.17</td>
</tr>
<tr>
<td>science and art centers</td>
<td>183</td>
<td>210.72</td>
</tr>
<tr>
<td>Total</td>
<td>388</td>
<td></td>
</tr>
</tbody>
</table>

4.4. Fourth finding for the question as “Which is the most important factor among the variables of affiliation, experience, and gender in terms of neural networks for explaining teachers pedagogical belief systems and teacher efficacy?”

4.4a. Finding for the question as “Which is the most important factor among the variables of affiliation, experience, and gender in terms of neural networks for explaining teachers pedagogical belief systems?”

Case processing summary can be given as below for neural networks for explaining pedagogical belief systems. It is seen that 281 individuals in the sample are used for training and 107 individuals are used for testing of neural networks and all of them are valid for the analysis.

Table 4.6. Case processing summary for neural network analysis

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>281</td>
<td>72.4%</td>
</tr>
<tr>
<td>Testing</td>
<td>107</td>
<td>27.6%</td>
</tr>
<tr>
<td>Valid</td>
<td>388</td>
<td>100.0%</td>
</tr>
<tr>
<td>Excluded</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>388</td>
<td></td>
</tr>
</tbody>
</table>

Network information for neural network analysis can be given in Table 4.7. As can be seen in the table, the activation function is the sigmoid function, and the number of hidden layers is two.
### Table 4.7. Network Information for the analysis

<table>
<thead>
<tr>
<th>Network Information</th>
<th>Input Layer</th>
<th>Covariates</th>
<th>1</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td>Number of Units&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rescaling Method for Covariates</td>
<td>Standardized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hidden Layer(s)</td>
<td>Number of Hidden Layers</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Units in Hidden Layer 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Units in Hidden Layer 2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activation Function</td>
<td>Sigmoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Layer</td>
<td>Dependent Variables</td>
<td>1</td>
<td>Learner-centered</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Teacher centered</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Units</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rescaling Method for Scale Dependents</td>
<td>Normalized</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activation Function</td>
<td>Sigmoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Error Function</td>
<td>Sum of Squares</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Excluding the bias unit

The general structure of the neural network for pedagogical belief systems is given in Figure 4.2.

![Neural network for pedagogical belief systems](image)

**Figure 4.2. Neural network for pedagogical belief systems**

Model summary of the neural network structure is given below. In the table training and testing, dimension is shown.

### Table 4.8. Model summary of the neural network structure

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Training</th>
<th>Sum of Squares Error</th>
<th>8,543</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Overall Relative Error</td>
<td>.962</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative Error for Scale Dependents</td>
<td>Learner-centered</td>
<td>.990</td>
</tr>
<tr>
<td></td>
<td>Teacher centered</td>
<td>.937</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stopping Rule Used</td>
<td>1 consecutive step(s) with no decrease in error&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Training Time</td>
<td>0:00:00.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Testing</td>
<td>Sum of Squares Error</td>
<td>3,397</td>
</tr>
<tr>
<td></td>
<td>Average Overall Relative Error</td>
<td>.983</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative Error for Scale Dependents</td>
<td>Learner-centered</td>
<td>1.007</td>
</tr>
<tr>
<td></td>
<td>Teacher centered</td>
<td>.960</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Error computations are based on the testing sample.

Independent variable importance analysis shows that affiliation is the most important factor for pedagogical belief systems in comparison to experience and gender dimensions.
4.4b. Finding for the question as which is the most important factor among the variables of affiliation, experience, and gender in terms of neural networks for explaining teachers’ teacher efficacy?

Case processing summary can be given as below for neural networks for explaining teacher efficacy. It is seen that 264 individuals in the sample are used for training and 124 individuals are used for testing of neural networks and all of them are valid for the analysis.

Table 4.10. Case processing summary for neural network analysis

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>Training</td>
<td>264</td>
</tr>
<tr>
<td></td>
<td>Testing</td>
<td>124</td>
</tr>
<tr>
<td>Valid</td>
<td></td>
<td>388</td>
</tr>
<tr>
<td>Excluded</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>388</td>
</tr>
</tbody>
</table>

Network information for neural network analysis can be given in Table 4.11. As can be seen in the table, the activation function is a sigmoid function, and the number of hidden layers is two.

Table 4.11. Network information for neural network analysis

<table>
<thead>
<tr>
<th>Network Information</th>
<th>Covariates</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Layer</td>
<td></td>
<td>Affiliation</td>
<td>Experience</td>
<td>Gender</td>
</tr>
<tr>
<td>Hidden Layer(s)</td>
<td>Number of Units</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rescaling Method for Covariates</td>
<td>Standardized</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Hidden Layers</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Units in Hidden Layer 1^a</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Units in Hidden Layer 2^a</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activation Function</td>
<td>Sigmoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Layer</td>
<td>Dependent Variables</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guidance</td>
<td>Behavioral-instructional-management</td>
<td>Motivation</td>
</tr>
<tr>
<td></td>
<td>Number of Units</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rescaling Method for Scale Dependents</td>
<td>Normalized</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activation Function</td>
<td>Sigmoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Error Function</td>
<td>Sum of Squares</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Excluding the bias unit

The general structure of the neural network for teacher efficacy is given in Figure 4.3.
Figure 4.3. The general structure of the neural network for teacher efficacy

Model summary of the neural network structure is given below. In the table training and testing, dimension is shown.

Table 4.12. Model summary of the neural network structure

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Training</th>
<th></th>
<th>Testing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Squares Error</td>
<td>34,864</td>
<td>15,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Overall Relative Error</td>
<td>.993</td>
<td>.996</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Error for Scale Dependents</td>
<td>.991</td>
<td>.995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guidance</td>
<td>1,001</td>
<td>1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioural-Instructional-Management</td>
<td>.988</td>
<td>.995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>.989</td>
<td>.991</td>
<td></td>
<td></td>
</tr>
<tr>
<td>teaching skills</td>
<td>.989</td>
<td>.991</td>
<td></td>
<td></td>
</tr>
<tr>
<td>assessment-evaluation</td>
<td>.991</td>
<td>.991</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stopping Rule Used</td>
<td>1 consecutive step(s) with no decrease in error</td>
<td>0:00:00,07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of Squares Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Overall Relative Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Error for Scale Dependents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioural-Instructional-Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>teaching skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>assessment-evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Error computations are based on the testing sample.

Independent variable importance analysis shows that experience is the most important factor for teacher efficacy in comparison to experience and gender dimensions.

Table 4.13. Independent variable importance analysis

<table>
<thead>
<tr>
<th>Independent Variable Importance</th>
<th>Importance</th>
<th>Normalized Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliation</td>
<td>.197</td>
<td>31.6%</td>
</tr>
<tr>
<td>Experience</td>
<td>.624</td>
<td>100.0%</td>
</tr>
<tr>
<td>Gender</td>
<td>.179</td>
<td>28.7%</td>
</tr>
</tbody>
</table>

4.5. Fifth finding for the questions as “Which is the most important factor among the sub-dimensions of teacher efficacy in terms of neural networks for explaining pedagogical belief systems? and “What are the correlations among the sub-dimensions of teacher efficacy?”
Case processing summary can be given as below for neural networks for explaining pedagogical belief systems. It is seen that 264 individuals in the sample are used for training and 124 individuals are used for testing of neural networks and all of them are valid for the analysis.

**Table 4.14. Case processing summary for neural network analysis**

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>Sample</td>
<td>264</td>
<td>68.0%</td>
</tr>
<tr>
<td>Training</td>
<td>124</td>
<td>32.0%</td>
</tr>
<tr>
<td>Valid</td>
<td>388</td>
<td>100.0%</td>
</tr>
<tr>
<td>Excluded</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>388</td>
<td></td>
</tr>
</tbody>
</table>

Network information for neural network analysis can be given in Table 4.7. As can be seen in the table, the activation function is a sigmoid function, and the number of hidden layers is two.

**Table 4.15. Network Information for the analysis**

<table>
<thead>
<tr>
<th>Network Information</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Layer</td>
<td>Covariates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>guidance</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Behavioral-instructional-management</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>motivation</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>teaching skills</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>assessment-evaluation</td>
</tr>
<tr>
<td>Hidden Layer(s)</td>
<td>Number of Units</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rescaling Method for Covariates</td>
<td>Standardized</td>
</tr>
<tr>
<td></td>
<td>Number of Hidden Layers</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Number of Units in Hidden Layer</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Number of Units in Hidden Layer</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Activation Function</td>
<td>Sigmoid</td>
</tr>
<tr>
<td>Output Layer</td>
<td>Dependent Variables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>learner-centered</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>teacher-centered</td>
</tr>
<tr>
<td>Number of Units</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Rescaling Method for Scale Dependents</td>
<td>Normalized</td>
<td></td>
</tr>
<tr>
<td>Activation Function</td>
<td>Sigmoid</td>
<td></td>
</tr>
<tr>
<td>Error Function</td>
<td>Sum of Squares</td>
<td></td>
</tr>
</tbody>
</table>

a. Excluding the bias unit

**Figure 4.4. Neural network for the sub-dimensions of teacher efficacy in terms of neural networks for explaining pedagogical belief systems**
Model summary of the neural network structure is given below. In the table training and testing, dimension is shown.

**Table 4.16. Model summary**

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Training</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Squares Error</td>
<td>7,465</td>
<td>3,924</td>
</tr>
<tr>
<td>Average Overall Relative Error</td>
<td>.921</td>
<td>.924</td>
</tr>
<tr>
<td>Relative Error for Scale Dependents</td>
<td>learner-centered</td>
<td>teacher-centered</td>
</tr>
<tr>
<td></td>
<td>.875</td>
<td>.841</td>
</tr>
<tr>
<td></td>
<td>.960</td>
<td>1,000</td>
</tr>
<tr>
<td>Stopping Rule Used</td>
<td>1 consecutive step(s) with no decrease in error⁴</td>
<td></td>
</tr>
<tr>
<td>Training Time</td>
<td>0:00:00,12</td>
<td></td>
</tr>
<tr>
<td>Sum of Squares Error</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Independent variable importance shows that the most important factor is the guidance for sub-dimensions of teacher efficacy in terms of neural networks for explaining pedagogical belief systems and the second one is the assessment and evaluation and motivation.

**Table 4.17. Independent variable importance analysis**

<table>
<thead>
<tr>
<th>Independent Variable Importance</th>
<th>Importance</th>
<th>Normalized Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guidance</td>
<td>.280</td>
<td>100.0%</td>
</tr>
<tr>
<td>Behavioural-Instructional-Management</td>
<td>.120</td>
<td>42.9%</td>
</tr>
<tr>
<td>Motivation</td>
<td>.212</td>
<td>75.5%</td>
</tr>
<tr>
<td>Teaching skills</td>
<td>.175</td>
<td>62.5%</td>
</tr>
<tr>
<td>Assessment-evaluation</td>
<td>.212</td>
<td>75.7%</td>
</tr>
</tbody>
</table>

It seems that the Spearman correlation constant is in parallel with the independent variable importance analysis. According to this, all the sub-dimensions of the learner-centered approach are in low level positive significant correlations with the pedagogical belief systems but no correlation is found with the teacher-centered approach except assessment and evaluation dimension.

**Table 4.18. Correlation analysis among the sub-dimensions of teacher efficacy and pedagogical belief systems**

<table>
<thead>
<tr>
<th>Spearman’s rho</th>
<th>learner-centered</th>
<th>behavioral-instructional-management</th>
<th>Motivation</th>
<th>teaching skills</th>
<th>assessment-evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman’s rho</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.343**</td>
<td>.258**</td>
<td>.328**</td>
<td>.312**</td>
<td>.207**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>388</td>
<td>388</td>
<td>388</td>
<td>388</td>
</tr>
<tr>
<td>Professor</td>
<td>Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.026</td>
<td>.058</td>
<td>.065</td>
<td>.037</td>
<td>.150**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.604</td>
<td>.257</td>
<td>.201</td>
<td>.463</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>388</td>
<td>388</td>
<td>388</td>
<td>388</td>
</tr>
</tbody>
</table>

When path analysis is conducted from teacher efficacy to pedagogical belief systems given as below, causal links cannot be modeled in the model presented below based on the correlation analysis although model fit values are very close to ideal values.
Figure 4.5. Path analysis from teacher efficacy to pedagogical belief systems

As it can be seen in table 4.19 p values are not significant so that the causal link cannot be inferred.

Table 4.19. Regression weights

<table>
<thead>
<tr>
<th>Label</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher-centered Assessment-</td>
<td>.150</td>
<td>.089</td>
<td>1.674</td>
<td>.094</td>
<td>Assessment-evaluation</td>
</tr>
<tr>
<td>Student-centered Teaching</td>
<td>.426</td>
<td>8.607</td>
<td>.049</td>
<td>.961</td>
<td></td>
</tr>
<tr>
<td>Student-centered Assessment-</td>
<td>-1.097</td>
<td>35.968</td>
<td>-.030</td>
<td>.976</td>
<td>Assessment-evaluation</td>
</tr>
<tr>
<td>Student-centered Motivation</td>
<td>7.555</td>
<td>358.127</td>
<td>.021</td>
<td>.983</td>
<td></td>
</tr>
<tr>
<td>Student-centered Behavioural-</td>
<td>5.089</td>
<td>218.168</td>
<td>.023</td>
<td>.981</td>
<td>Instructional-</td>
</tr>
<tr>
<td>Student-centered Guidance</td>
<td>-11.735</td>
<td>536.209</td>
<td>-.022</td>
<td>.983</td>
<td>Management</td>
</tr>
</tbody>
</table>

4.6. Sixth finding for the questions as “Which is the most important factor among the sub-dimensions of pedagogical belief systems in terms of neural networks for explaining teacher efficacy?

Model summary of pedagogical belief systems in terms of neural networks for explaining teacher efficacy can be given as in Table 4.19. According to this sum of squares error is 29,718 for training and 12,589 for testing.
Table 4.19. Model summary of pedagogical belief systems in terms of neural networks for explaining teacher efficacy

<table>
<thead>
<tr>
<th>Model Summary</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of Squares Error</td>
<td>29,718</td>
<td></td>
</tr>
<tr>
<td>Average Overall Relative Error</td>
<td>.911</td>
<td></td>
</tr>
<tr>
<td>Relative Error for Scale Dependents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guidance</td>
<td>.893</td>
<td></td>
</tr>
<tr>
<td>Behavioural-Instructional-Management</td>
<td>.925</td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>.887</td>
<td></td>
</tr>
<tr>
<td>Teaching skills</td>
<td>.905</td>
<td></td>
</tr>
<tr>
<td>Assessment-evaluation</td>
<td>.943</td>
<td></td>
</tr>
<tr>
<td>Stopping Rule Used</td>
<td>1 consecutive step(s) with no decrease in error^a</td>
<td></td>
</tr>
<tr>
<td>Training Time</td>
<td>0:00:00,12</td>
<td></td>
</tr>
<tr>
<td>Testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of Squares Error</td>
<td>12,569</td>
<td></td>
</tr>
<tr>
<td>Average Overall Relative Error</td>
<td>.887</td>
<td></td>
</tr>
<tr>
<td>Relative Error for Scale Dependents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guidance</td>
<td>.820</td>
<td></td>
</tr>
<tr>
<td>Behavioural-Instructional-Management</td>
<td>.897</td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>.889</td>
<td></td>
</tr>
<tr>
<td>Teaching skills</td>
<td>.870</td>
<td></td>
</tr>
<tr>
<td>Assessment-evaluation</td>
<td>.960</td>
<td></td>
</tr>
</tbody>
</table>

^a. Error computations are based on the testing sample.

According to findings, the learner-centered approach is the most important dimension of pedagogical belief systems in terms of neural networks for explaining teacher efficacy.

Table 4.20. Independent variable importance of pedagogical belief systems in terms of neural networks for explaining teacher efficacy

<table>
<thead>
<tr>
<th>Independent Variable Importance</th>
<th>Importance</th>
<th>Normalized Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learnercentered</td>
<td>.611</td>
<td>100,0%</td>
</tr>
<tr>
<td>Teachercentered</td>
<td>.389</td>
<td>63,7%</td>
</tr>
</tbody>
</table>

Based on the neural network analysis, it is thought that it will be appropriate to create a model from a learner-centered approach to guidance, behavioral/instructional-management, motivation, and teaching skills dimensions given in Figure 4.6.
Path analysis results show that there is a causal connection from learner-centered approach to guidance, behavioral-instructional-management, motivation, and teaching skills dimensions in Table 3.23. Most of the model fit values are at an acceptable level.

### Table 3.23. Path analysis results and model fit values

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: learner-centered → Guidance</td>
<td>.376</td>
<td>.069</td>
<td>5.438</td>
<td>***</td>
<td>✔</td>
</tr>
<tr>
<td>H2: learner-centered → Behavioural-Instructional-Management</td>
<td>.355</td>
<td>.072</td>
<td>4.954</td>
<td>***</td>
<td>✔</td>
</tr>
<tr>
<td>H3: learner-centered → Motivation</td>
<td>.231</td>
<td>.048</td>
<td>4.852</td>
<td>***</td>
<td>✔</td>
</tr>
<tr>
<td>H4: learner-centered → Teaching skills</td>
<td>.443</td>
<td>.081</td>
<td>5.463</td>
<td>***</td>
<td>✔</td>
</tr>
</tbody>
</table>

CMIN/DF= 1.935 CFI= .930 RMSEA= .049 AGFI= .879 PNFI= .760 GFI= .930 RMR= .019
NFI= .867 IFI= .931 RFI= .848

P values less than 0.001 are indicated by ***.

## 5. DISCUSSION AND CONCLUSION

It was shown that the gender variable doesn’t make any significant difference in teacher’s pedagogical belief systems and teacher efficacy. This shows that gender has no role in affecting pedagogical belief systems and their teacher efficacy for this sample. Some studies support the finding of this study in terms of teacher efficacy. For instance, Bilali (2013) expresses that female and male teachers had similar levels of self-efficacy. However, some studies show that gender had a statistically significant influence on teachers’ self-efficacy (Salero et al. 2015; Lesha, 2017; Aurah and McConnell, 2014; Butucha, 2013; Butucha, 2014; Kinyua and Oboko, 2013; Klassen and Chiu, 2010). Some studies (Coladarci & Breton, 1997; Romi & Leyser, 2006) found higher efficacy scores in favor of female teachers, which Ross et al. (1996) explained by the perception of teaching as a more female profession. Similarly, in the studies conducted by Can and Çelik (2018), Sosyal, Kütluca, and Radmard (2018), Tezci, Dilekli, Yıldırım, Kervan, and Mehmeti (2017), Çoşkun (2020), it was concluded that female teacher candidates were more prone to student-centered understanding compared to male teacher candidates. Akay ve Boz, (2011), Saracaloğlu et al (2013), Kütluca (2018), and Yarali (2019), however, found that pedagogical beliefs did not differ concerning the gender variable of teachers and teacher candidates so that this researches also support the findings of this study. This study shows that gender is not an affecting factor for pedagogical belief systems and teacher efficacy because these dimensions should be affected by more cognitive and affective dimensions rather than a sociological dimension like gender. It can be concluded that the teacher education system might be effective for eliminating the effect of this variable in terms of pedagogical perspective in this respect or at least for his sample it is observed no such an effect. Another reason for this result may be stemmed from the heterogeneous character of the sample of this study. Maybe in terms of specific levels, the gender variable can show its effect depending on the branch, school, or specific location. It should be noted that it is investigated the perception of pedagogical belief systems and teacher efficacy of teachers so, in reality, these can differ according to gender in real teaching and learning process also. Besides, as the sample of this study, science and art centers are one of the extensive participant groups. So that in consideration of the findings and discussion above, these teachers are also chosen according to their professional capacity through some criteria. Some of these criteria are scientific studies, projects, awards, postgraduate education, etc…of the applicants. So it is not important for the Ministry of National Education to level the gender effect.

It was shown that the experience variable doesn’t make any significant difference in teacher’s pedagogical belief systems and their teacher efficacy. This result is found to be very surprising for the researchers of this study for the teacher efficacy as emphasized by Bandura (1997), the most significant source for developing self-efficacy belief is actual experiences. According to research on teacher self-efficacy beliefs and resources, experienced teachers’ self-efficacy beliefs are more resistant to change than are new teachers and that experience play the main role in changing teachers’ self-efficacy beliefs (Tschannen-Moran & McMaster, 2009; Tschannen-Moran & Johnson, 2011; Woolfolk-Hoy & Spero, 2005). Researchers believe that teachers’ self-efficacy can be expressed as
"can-do rather than will-do" since self-efficacy must contain the assumption in capacity. Can is a judgment on competence; Will is linked to intention (Bandura, 2006: 308; Klassen and Chiu, 2010). Klassen and Chiu (2010) found that teachers’ self-efficacy was influenced by years of experience in a nonlinear relationship, with the three factors of teacher efficacy increasing with experience for early and mid-career stage teachers and declining for teachers in the late-career stages’. The finding of this research is also against Huberman’s (1989) professional life cycle of teachers implying that there should be variations according to those stages as the experience increases. Therefore, job experience should be an important factor since their teacher efficacy is thought to be learned in the process and practice of education. This can be explained by other contextual variables mediated by financial worries, job or life satisfaction, or other social factors, etc. However, no variation in pedagogical belief systems implies that teachers have similar belief systems regarding education. Variations in pedagogical belief systems are especially expected to be seen in a sudden shift from a particular educational philosophy to another one. For example, In 2004, the Ministry of National Education launched primary and secondary education initiatives and then devised plans to execute the programs. Till 2004, the Ministry pushed the behaviorism, which is the dominating psychological paradigm in our educational system, and historically called essentialist and permanent in education, and instead followed progressive social-cognitive psychological constructivist methods which was a result of the pragmatism in educational thought. Along with this, the teaching and learning results in the course were redesigned to encourage a more constructivist method. Here, it cannot be assumed that the systems fully adopt teachers. This improvement was introduced without sufficient experimentation and the teachers were not pleased. Many teachers were unwilling to adjust to the modern teaching style, they knew that their best years had passed (Baş, 2011). In such phases, it can be observed more dichotomies and variations in terms of the job experience of teachers. However, after passing 17 years, it is probable that most teachers adopt a similar philosophy because there is no abrupt change in the philosophy of education since then. When it is taken into consideration about science and art centers, teachers that are a participant for this study may answer the questions of the scale according to their perceptive situations about their experimentation in their affiliations. Because gifted learners’ curricula are completely different from a standard curriculum. There are many more recent models for the education of the gifted. The applicants who want to teach in science and art centers may have a long experience of their occupation but when they started to teach in science and art centers for the gifted, they have to be like a new candidate, have to be always a learner and have to produce new plans for each student group. Because gifted students never accept a traditional and normal school-based curriculum and they are always eager to gain recent and top-level information and abilities.

It was shown that the affiliation variable makes a significant difference in teacher’s pedagogical belief systems but makes no significant difference in their teacher efficacy except for their teaching skills. It is found that the learner-centered approach is mostly adopted by primary school teachers and compared to primary school teachers, secondary school and science and art centers teachers have less mean rank in this respect. While the teacher-centered approach takes the transfer of information independent from the individual, student-centered understanding accepts, by contrast, that knowledge may differ depending on the experience and interpretation of the individual (Ertmer & Newby, 2013). Hence maybe because of the complication of the information in different affiliations or maybe the student characteristics may result in such a finding. Independent variable importance analysis of this study also shows that affiliation is the most important factor for pedagogical belief systems in comparison to experience and gender dimensions so that it implies affiliation has some sort of effective role shaping pedagogical beliefs of the teachers. In terms of the teacher-centered approach, the highest mean rank belongs to secondary school teachers whereas the lowest value belongs to science and art center teachers which are expected from science and art centers teachers because of the nature of the students they are dealing with since those student needs to be more independent and more autonomous activities than others. For the science and art center teachers, teacher-centered results’ low appearance may have seen normal because of the gifted program requirements, but it may not have seen normal for student-centered results’ low appearance. But as stated through the previous paragraphs about findings, it may differ about teachers’ proficiency perception who started to work in science and art centers in recent years. So the teachers who are accepted for these centers recently maybe haven’t adapted to the students yet. Because gifted students
sometimes have behavioral disturbances. Hence it is one of their natural characteristics. It is not only a binding discussion for science and art centers but also the same for some schools that have a problematic socio-cultural environment. This differentiation affects the students’ tendency to education, so at the same time, it also affects teachers’ approach to teaching.

It is also shown that teaching skills dimensions in the teacher efficacy scale, the highest mean rank belongs to science and art centers teachers whereas the lowest mean rank belongs to secondary school teachers. According to Hoy and Davis (2006), lower time spent on tasks, willingness to feedback, motivation in the classroom, higher goals, and persistence in the face of obstacles is the direct implications of teacher efficacy. In this respect, it is expected that teacher efficacy should vary from affiliations since those dimensions are also related to the characteristics of the students as well. Independent variable importance analysis of this study supports this claim by showing that experience is the most important factor for teacher efficacy in comparison to experience and gender dimensions. Some studies also support this assumption. For example, Klassen and Chiu (2010) and Wolters and Daugherty (2007) observed that teachers in higher grades have low self-efficacy and that the inverse association between grade level and self-efficacy. The reason why it is found that teaching skills dimensions in teacher efficacy scale, the highest mean rank belongs to science and art centers teachers can be explained by teachers in the science and art centers is specially chosen ones based on particular criteria such as having an M.S or Ph.D. degree, making national or international projects, etc. Therefore, the finding of the study may imply the result of this filtering process in science and art centers. According to Tweed (2013), the perception of self-efficacy defines when instructional acts can be enforced, how much commitment will be placed into the practice, and how long the activity will continue in the face of setbacks and failures. Highly effective people have a greater chance of success than those with low self-efficacy so that this can reflect itself in this dimension as a significant difference. Hence, our result implies that teachers in science and art centers as more efficacious teachers can handle complex situations easily, have good decision - making and management skills, use instructional strategies more effectively, sustain the students' interest, maintain the continuity of the task, have better classroom management skills and are more willing to embrace novel teaching methods (Tschannen-Moran & Woolfolk Hoy, 2001; Milner & Woolfolk Hoy, 2003; Hansen, 2005) so that their characteristics are compatible with the standards of gifted education. Science and art teachers always have to be ready and researchable for gifted education. As stated before, the teachers working in these centers are being gone through an interview by the Ministry of National Education. For this interview, not all the applicants have a chance to be accepted. Before some criteria about their competences and documents designate their situation to attend the interview. So these teachers already think that they will be benignant for the education and also for the gifted. They may believe it and they are professional than the other applicants as they could attend the interview and be accepted by the Ministry of National Education.

Independent variable importance shows that the most important factor is the guidance for sub-dimensions of teacher efficacy in terms of neural networks for explaining pedagogical belief systems and the second one is the assessment and evaluation and motivation. It seems that the Spearman correlation constant is in parallel with the independent variable importance analysis. According to this, all the sub-dimensions of teacher efficacy are in low level positive significant correlations with the pedagogical belief systems but no correlation is found with the teacher-centered approach except assessment and evaluation dimension. When path analysis is conducted from teacher efficacy to pedagogical belief systems, causal links cannot be modeled based on the correlation analysis although model fit values are very close to ideal values so that p values are not significant so that the causal link cannot be inferred. According to findings, the learner-centered approach is the most important dimension of pedagogical belief systems in terms of neural networks for explaining teacher efficacy. Therefore a new model was created based on this fact so that path analysis results show that there is a causal connection from learner-centered approach to guidance, behavioral-instructional-management, motivation, and teaching skills dimensions to some extend. When the literature is examined studies are supporting the finding of this study. Coşkun (2020) found a low-level positive relationship between "student-centered" understanding and self-efficacy beliefs. Ocak, Ocak ve Kalender (2017) observed a modest positive correlation between student-centered beliefs and self-efficacy while they could not
find a relationship between teacher candidates' self-efficacy beliefs and pedagogical beliefs in a teacher-centered perspective. Kutluca (2018) stated that there is a moderate positive relationship between teacher self-efficacy beliefs and pedagogical beliefs, and pre-service teachers with high self-efficacy use pedagogical approaches better. When the items of the teacher efficacy and learner-centered approach are examined by considering independent variable importance analysis it can be easily predicted why there is a low-level correlation found between them. Items of Guidance dimensions are like this “What level of power do you have to explain to your student what behavior you expect from him/her?” (item 5) or “How strongly do you have to contribute to the critical thinking of your students?” (item 2) so that they are all concerned with the needs of the students. Additionally, the low-level positive correlation may imply the perception and behavior dichotomy in this regard. Maybe teachers don’t internalize teacher-centered beliefs or teacher self-efficacy beliefs so that it reflects itself in this low-level correlation. The teacher's beliefs’ who are good at and believe learner-centered approach are expected to guide students with their best effort. These teacher characteristics manifest themselves in all ambiance and have multifarious competencies. So by the guidance competency of them and teaching skills abilities, motivation comes automatically for all fields. The teachers who have these competencies always motivate themselves and their students under all circumstances. Thoroughly the most important factor about learning and teaching process assessment comes into view. As reported by the percent factors of sub-dimensions of pedagogical belief systems, motivation and assessment are so close to each other. These sub-dimensions are generally the most important factors in the teaching and learning process, so it can be specified that the findings of the study show confidential results. Besides, when checked about the teacher-centered approaches' correlations, to a specific degree assessment evaluation has a positive relationship. The other sub-dimensions that are the most important respects about effective education can’t be seen in the teacher-centered approach. This is why from 2004, constructivism was detected by the curricula development specialists that only assessment and evaluation can’t be successful in education that innovative approach term has begun and student-centered approach has shown its important side.

6. RECOMMENDATIONS

First of all, the reason why the experience variable doesn’t make any significant difference on teacher’s pedagogical belief systems and their teacher efficacy could be revealed by qualitative or mixed research designs. For data acquisition only using quantitative methods like scales may not be enough for acquiring extensive results. By the qualitative data, participants can reflect their perspectives extensively and also limited but general discussions can be presented for research. Secondly, the sources of affiliation variable making a significant difference on teacher’s pedagogical belief systems but making no significant difference on their teacher efficacy except for their teaching skills could be revealed by different methods such as interviews or focus-group interviews. Finally, the perception and behavior dichotomy both in pedagogical belief systems and their teacher efficacy can be examined by subsequent studies. Moreover, according to the results of the findings of this research, the highest percent proportion of teaching skills is seen for science and art center teachers. This may mean that the other affiliations of teachers except for science and art centers don’t need to improve their teaching skill competencies, maybe because of the students’ reluctant and usual learning atmospheres. But this factor shouldn’t be an obstacle for their teachers to develop their teaching competencies. As teachers enhance their competencies, in direct proportion, their efficacy will enhance automatically. Starting from this point of view, teachers, whatever the seniority of their occupation is, should get in-service training programs. Innovative techniques and methods take an important role in this fact. By the global updating of educational methods and approaches, by the globalization of the world and by the general development of the whole countries, students’ educational requirements also increase. When the teachers can’t encounter these requirements students may not be satisfied and their attitude toward schools and education also decreases. So to feel benignant throughout the teaching environment, in-service training should be planned innovatively and let the teachers have this education properly.
REFERENCES


Lesha, J. (2017). Gender Differences In Primary School Teachers’ Self-Efficacy Beliefs. European Journal of Education Studies, 0. doi:http://dx.doi.org/10.46827/ejes.v0i0.1174


495


