



# International Journal of Progressive Education

**IJPE**  
INASED Published®

IJPE ISSN (Print) : 2834-7919

IJPE ISSN (Online) : 1554-5210

---

[ijpe.inased.org](http://ijpe.inased.org)

---

# IJPE

---

**International Journal of  
Progressive Education**

**Volume 19      Number 2      April 2023**

**DOI: 10.29329/ijpe.2023.534**



*An International Journal Published by International Association of Educators (INASED)*

## **International Journal of Progressive Education**

**Frequency:** Six times a year.

**ISSN:** 2834-7919 / **E-ISSN:** 1554-5210

**Owner & Publisher:** International Association of Educators

### **Indexing/Abstracting:**

1. **ERIC:** <http://www.eric.ed.gov>
2. **H.W. Wilson (Education Full Text):**  
<https://www.ebsco.com/m/ee/Marketing/titleLists/eft-coverage.htm>
3. **ERIH Plus:** <https://dbh.nsd.uib.no/publiseringskanaler/erihplus/>
4. **EBSCO Publication:** <http://www.ebsco.com>
5. **Cabell's Directory of Publishing:** <http://www.cabells.com>

### **2023 Subscription Rates**

- \$120 Association Member USA (Canada: \$130; Rest of World: \$140)
- \$140 Individual USA (Canada: \$150; Rest of World: \$170)
- \$110 Student USA (Canada: \$120; Rest of World: \$140)
- \$240 Library/Institution USA (Canada: \$260; Rest of World: \$360)
- Single Issues and Back Issues: \$35 USA (Canada: \$45; Rest of World: \$55)

If you wish to subscribe for the printed edition of IJPE, please contact the Customer Service department at [secretary@inased.org](mailto:secretary@inased.org)

**Editor**

Hakan Dedeoglu

Hacettepe University, Turkey

**Associate Editors**

Bertram Chip Bruce  
Chen Xinren

University of Illinois at Urbana-Champaign, USA  
Nanjing University, China

**Managing Editor**

Mustafa Yunus Eryaman

Çanakkale Onsekiz Mart University, Turkey

**Editorial Review Board (Board of Referees)**

Peggy Placier  
Yang Changyong  
Sharon Tettegah  
Fernando Galindo  
Susan Matoba Adler  
Carol Gilles  
Julie Matthews  
Cushla Kapitzke  
Catalina Ulrich  
Juny Montoya  
Kwok Keung HO  
CHAN, Raymond M C  
Winston Jumba Akala  
Pragasit Sitthitikul  
Funda Savasci  
Sheila L. Macrine  
Raul Alberto Mora Velez  
Van-Anthoney Hall  
Pauline Sameshima  
Bongani Bantwini  
Martina Riedler  
John L. Pecore  
Levent Cetinkaya  
Yasser A. Al-Hilawani

University of Missouri-Columbia, USA  
Southwest China Normal University China  
University of California, Santa Barbara USA  
Universidad Mayor de San Simón, Bolivia  
University of Hawaii, USA  
University of Missouri-Columbia, USA  
University of the Sunshine Coast, Australia  
Queensland University of Technology, Australia  
Universitatea din Bucuresti, Romania  
Universidad de Los Andes, Bogotá, Colombia  
Lingnan University, Hong Kong  
Hong Kong Baptist University  
University of Nairobi, Kenya  
Walailak University, Thailand  
Istanbul University, Turkey  
University of Massachusetts Dartmouth, USA  
University of Pontificia Bolivariana, Columbia  
University of Illinois at Urbana-Champaign, USA  
Lakehead University, Canada  
University of Venda, South Africa  
Canakkale Onsekiz Mart University, Turkey  
University of West Florida  
Canakkale Onsekiz Mart University, Turkey  
Yarmouk University, Jordan

**Assistant Managing Editors**

Nihat Gurel Kahveci  
Alex Jean-Charles  
Olgun Sadık  
Orhun Kaptan  
Mehmet Emrah Kuru

Istanbul University, Turkey  
Missouri State University, USA  
Indiana University, USA  
Istanbul University  
Çanakkale Onsekiz Mart University, Turkey

**Advisory Board**

Naomi Tsunematsu  
Lu Youquan  
Ma Hemin  
Chrispen Matsika  
Jeylan Woliye Hussein

Hiroshima University, Japan  
East China Normal University, China  
East China Normal University, China  
Georgia College&State University  
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, 2023, International Association of Educators (INASED). ISSN 2834-7919 / E-ISSN 1554-5210

## TABLE OF CONTENTS

Volume 19, Number 2  
April 2023

### Articles

- 1 Are iGen Freshman Different? Notetaking Habits of STEM Students: A Descriptive Study**  
Authors: *Marie-Christine Potvin, Monique Chabot, Abigail Garrity, Richard Hass, Colleen Zane & Anne Bower*
- 19 Eliminating Reading Difficulty in an Elementary 4th Grade Student Based on Learning Style**  
Authors: *Metin Gül & Olcay Özdemir*
- 37 Caught Off Guard: Parenting Children with Disabilities During COVID-19 Pandemic**  
Authors: *Salih Rakap, Meryem Vural Batık, Mustafa Karnas, Sinan Kalkan, Uygur Bayrakdar & Halil İbrahim Sari*
- 54 The Destruction Seen in Disadvantaged Bilingual Students in Rural Regions of Turkey: A Theoretical Study of Sad Portraits**  
Author: *Yusuf Kızıltaş*
- 74 Developing a Culture-Adapted Mindfulness Stress Reduction Program**  
Authors: *Halil İbrahim Özok & Fuat Tanhan*
- 92 Teaching and Learning Conceptions of Pre-service English Language Teachers**  
Author: *Hilal Güneş*
- 102 Teacher Leadership and Classroom Management: A Research on Preschool Teachers**  
Authors: *Rengin Zembat, Hilal Yılmaz, Şeyma Değirmenci & Büşra Çelik*
- 118 Rubric for Evaluating Text Structure-Oriented Reading Tasks: A Study of Validity and Reliability**  
Authors: *Zeynep Çetinkaya Edizer, Melda Oryaşın, Şükran Dilidüzgün & Duygu Ak Başoğlu*
- 135 Review of Researches on Pedagogical Content Knowledge Published in ESERA (2009-2019) Conference Books**  
Author: *Şeyma Ulukök Yıldırım*
- 152 The Examination of Representations in Primary School Science Textbooks from the Perspective of Multimodal Genre Analysis**  
Author: *Elif Güven Demir*
- 173 Development of Turkish Speaking Anxiety Scale**  
Authors: *Mahmut Ayaz, Süleyman Kasap & Zafer Açar*



## **Are iGen Freshman Different? Notetaking Habits of STEM Students: A Descriptive Study**

**Marie-Christine Potvin<sup>i</sup>**

Thomas Jefferson University

**Monique Chabot<sup>ii</sup>**

Widener University

**Abigail Garrity<sup>iii</sup>**

Thomas Jefferson University

**Richard Hass<sup>iv</sup>**

Thomas Jefferson University

**Colleen Zane<sup>v</sup>**

Thomas Jefferson University

**Anne Bower<sup>vi</sup>**

Thomas Jefferson University

### **Abstract**

Notetaking practices (e.g., modality, strategies) as well as confidence with notetaking has been linked to college success. A descriptive study was undertaken to explore the notetaking practice of a sample of freshman STEM students (n=139) over the duration of their first semester in college. The study found that iGen STEM students prefer taking handwritten notes when entering college, and that this preference persists throughout the first semester. Students report using a variety of strategies consistently throughout the semester while taking notes (e.g., abbreviation, summarizing, highlighting) and a desire to improve their time efficiency with notetaking. Students report use of more active learning strategies when interacting with their notes by the end of the first semester. While the amount of time spent engaging with their notes remained constant at 2.5 to 3 hours per week per class, more students created their own test questions, used drawing and labelling, and wrote connections between concepts by the end of the first semester. STEM students from the iGen generation demonstrate a preference for handwritten notes. They appear to adjusted their notetaking strategies over the semester and interacted with their notes in ways that supported learning.

**Keywords:** Note-Taking, iGen, Freshman

**DOI:** 10.29329/ijpe.2023.534.1

**Submitted:** 20/02/2021

**Accepted:** 17/01/2023

**Published:** 01/04/2023

---

<sup>i</sup> **Marie-Christine Potvin**, Prof. Dr., Occupational Therapy, Thomas Jefferson University, ORCID: 0000-0002-1653-5515

<sup>ii</sup> **Monique Chabot**, Associate Professor, Occupational Therapy, Widener University, ORCID: 0000-0001-9791-6231

**Correspondence:** mcchabot@widener.edu

<sup>iii</sup> **Abigail Garrity**, Research Assist, Occupational Therapy, Thomas Jefferson University

<sup>iv</sup> **Richard Hass**, Associate Professor, Program Director of Population Health Science and Health Data Science programs, ORCID: 0000-0002-9545-4800

<sup>v</sup> **Colleen Zane**, Occupational Therapy, Thomas Jefferson University

<sup>vi</sup> **Anne Bower**, Prof., Biology, Thomas Jefferson University, ORCID: 0000-0002-0916-5915

## INTRODUCTION

Student-centered interactive pedagogies in science, technology, engineering, and mathematics (STEM) courses in higher education have been shown to increase learning and have been recommended as best practices (National Research Council, 2012). However, a recent survey of 25 institutions and 2000 STEM courses indicates that lecture remains the dominant pedagogical method with 87% of class time spent with students listening to the instructor and taking notes (Stains et al., 2018). Thus, notetaking continues to be a critical aspect of academic success in higher education for STEM students (McGuire, 2015; Peverly et al., 2013). It is a key component of learning as it assists students with making connections between content, organizing material, and retaining information (Boyle et al., 2015; McGuire, 2015; Peverly et al., 2013). The primary method of notetaking for decades has been handwriting, however this began to change in the late 1990s with the advent of portable computers (Luo et al., 2018; Quade, 1996). Since then, technology options which include laptops, tablets, and smartphones, have allowed students to take notes digitally by, for example, typing notes into word processing software (Stacy & Cain, 2015).

Shortly after students began to type their notes, scholars began to debate whether these digital notes were of the same quality and thus had equivalent ability to foster learning as handwritten notes (Quade, 1996). Extensive research has been published on this topic, and much is now understood about the benefits and drawbacks of digital notetaking (Aguilar-Roca et al., 2012; Bui et al., 2013; Fried, 2008; Hembrooke & Gay, 2003; Luo et al., 2018; Mueller & Oppenheimer, 2014; Quade, 1996; Skolnik & Puzo, 2008; Wurst et al., 2008). Surprisingly, however, little research has been conducted regarding college students' notetaking practices more broadly. Understanding how students take notes is critical to understanding how students learn from lectures, and, ultimately, supporting students in taking full advantage of notetaking as a tool to foster their academic success (Morehead et al., 2019; Witherby & Tauber, 2019). In fact, only two studies (Morehead et al., 2019; Witherby & Tauber, 2019), both published in 2019, have addressed this topic in the last 40 years. Prior to this, one study was published in 1974 by Palmatier and Bennett who noted that a dearth of studies on this topic had been conducted since the 1940s. Much has changed in academia since the 1940s, and even the 1970s, from teaching-learning methodologies to available educational technology. Thus, updating the knowledge base related to notetaking practices of college students is essential given the crucial role that quality notes has on college success (Annis, 1981; Boyle et al., 2015).

Morehead et al. (2019) and Witherby and Tauber (2019) have begun to fill this gap. Morehead et al.'s (2019) sample consisted of students (n=312) enrolled in psychology courses whereas Witherby & Tauber (2019) surveyed students (n=364) of a variety of majors and minors but their results are not broken down by type of majors. Results of both studies revealed that over 90% of students report taking notes in class, and approximately 85% of students report taking handwritten notes (Morehead et al., 2019; Witherby & Tauber, 2019). Students have reported that their notetaking modality depends on the style or discipline of the class (Morehead et al., 2019). STEM students may have different notetaking habits given the nature of the course that they take. For example, science students include diagrams during notetaking, which may influence their notetaking practices (Manalo et al., 2013). Thus, extrapolating from the Morehead et al. (2019) or the Witherby and Tauber (2019) article to STEM students would be ill advised. Further, current generation of students, the iGen generation, are much different from the students of the 1970s. iGen students have been termed "digital natives" since they have grown up with access to high speed internet, smart devices, and ever-advancing technology (Gose, 2017). Their status as digital natives may, in fact, shape their notetaking practices, making them, for example, more inclined to take digital notes than previous generations. To ascertain the degree to which current students are true digital natives, it is important to determine their confidence in their own computer skills.

What aspects of iGen STEM students' notetaking practices shall be investigated? The extensive literature about aspects of notetaking that influence the quality of notes and the success of students was examined. Given that much of the research conducted on college notetaking is related to notetaking modality (e.g., handwritten, typed notes), better understanding iGen STEM students'



natural notetaking modalities in courses, as opposed to notetaking modalities contrived by a study's group assignment (e.g., Aguilar-Roca et al., 2012; Bui et al., 2013; Chen et al., 2017; Kim, 2018; Luo et al., 2018; Luo et al., 2016) is important.

Related to notetaking modality, studies have found that students can type faster than they can handwrite, thus, they have the ability to capture more information, resulting in more verbatim notes (Bui et al., 2013; Mueller & Oppenheimer, 2014). During digital notetaking, about 20% of students took verbatim notes, whereas 36.5% paraphrase information (Witherby & Tauber, 2019). More captured information may yield notes of greater quality in terms of accuracy, completeness, and detail (Bonner & Holliday, 2006). However, it has been hypothesized that students who take verbatim notes do not process information properly (Mueller & Oppenheimer, 2014). Given these findings, questions related to what information students are attempting to capture while taking notes (i.e., strategy), whether digital or handwritten, is important.

The literature tells us that notetaking modality is not the only important aspect of notetaking. Students need to be engaged with their notes for true learning to occur (Ramsay & Sperling, 2011). Paraphrasing, restating, recopying, and creating visual notes are examples of the ways that students can engage with the information present in their notes (Luo et al., 2018; Ramsay & Sperling, 2011). Along the same line, time spent reviewing notes, reason for taking notes, and review strategies are important aspects of notetaking (Luo et al., 2018; Morehead et al., 2019). Regardless of notetaking modality, it is thus critical to learn from students about the strategies that they use to engage with their notes.

A final aspect of notetaking found to be important in the literature is confidence. Carrier (1988) found, three decades ago, that freshman lack self-confidence in notetaking. They also found a negative relationship between confidence and final grades, with students who lacked confidence in notetaking having lower grades (Carrier et al., 1988). Little research has been conducted on this topic since. Witherby and Tauber (2019) found in their study that college students felt confident in their notetaking abilities, however just short of half of the sample stated that they would participate in a workshop about improving their notetaking abilities. This is concordant with the study by Morehead et al. (2019) who found that nearly 60% of students reported that they wished they had better notetaking abilities. Given the relationship between confidence and grades, understanding the degree of confidence of iGen STEM students in their notetaking abilities is crucial.

There are multiple gaps in knowledge related to iGen STEM college students' notetaking practices that must be filled. For this purpose, a descriptive study was undertaken to answer the following research questions:

1. What are the notetaking practices (i.e., modalities, strategies, engagement, and confidence) of freshman STEM students?
2. Do freshman STEM students have similar patterns of notetaking practices at 3 time points within their first semester (at the start, midterm, and final weeks) in college?

## **METHODS**

Since the published literature contains little information on the notetaking practices of the current generation of freshman STEM students, a descriptive study was designed for the intention of gathering information to understand their current notetaking choices and inform future studies. Descriptive studies capture characteristics of groups of people without introduction of an intervention or manipulation of variables, making it an appropriate choice for the type of information being gathered (Portney & Watkins, 2009).

### **Sample and Recruitment Procedure**

Participants were recruited from all sections of two science courses (i.e., biology and chemistry) taken by first semester students at a medium-sized private nonprofit university on the east coast of the United States. The students in all the course sections of these courses were eligible to participate in the study. The informed consent process occurred in class, with instructors' permission, during the first two weeks of the semester. Students who consented to participate in the study completed a first set of questionnaires at that time (Time 1). Students who wished to participate in the study, but who were not at least 18 years old were asked to have their parents sign the informed consent form. Of the 214 potential subjects, 139 students signed the informed consent form. A summary of the demographic information for all participants is provided in the narrative of the result section.

The study sought and obtained approval from the university's institutional review board. Data safety and subjects' anonymity were protected through the use of password protected electronic files on a secure network, codes to identify subjects, and physical copies of the measurement tools and informed consent forms being kept in a locked file cabinet.

### **Data collection procedure**

The second, fifth, and sixth authors collected data at three points during the Fall semester of the participants' freshman year: Time 1 (weeks 1-2), Time 2 (weeks 5-6), and Time 3 (weeks 10-12). The data were collected during chemistry or biology class periods at the convenience of the course instructors. The data collected in class consisted of paper questionnaires which took approximately 20 minutes to complete.

Two questionnaires were the primary source of data for the study: Sociodemographic Questionnaire (SDQ) and the Notetaking Abilities and Strategies of University Students (NASUS). The SDQ, administered at Time 1, was created by the research team to collect background information regarding participants' age, ethnicity, socio-economic background, educational profile including those of parents, standardized test tests taken, any previous diagnosis, hours of study and work, and major of study.

The NASUS was administered at all three time points to collect information about the participants' current notetaking modalities, strategies, and confidence. The NASUS was developed by the research team given that no existing questionnaire of modern multi-modal notetaking modality, strategies and confidence existed. The content validity, test-retest reliability, construct validity, and concurrent validity of the NASUS were established concurrently to this study (Chabot et al., 2021). A multi-step process was used to develop the questionnaire and establish its content validity including literature review, divergent item generations by multiple groups of graduate students, pilot testing, and revisions. Items were clustered into 6 domains related to modality, strategy, and confidence: notetaking modality used, frequency of notetaking modality used, reason for taking notes, desired aspects of notetaking to be improved, time spent reviewing notes, and note organization and review strategies. Response formats varied from question to question and included yes/no, percent of time, and Likert scales ranging from agree to disagree. The test-retest reliability of the questionnaire was established using statistical approaches based on the response scale of questions (i.e., ordinal "% of time", binary selected / not select, and Likert-type scales). Across the 13 ordinal items, the average test-retest reliability, using Spearman's rho, was  $\rho = .68$ . Binary items showed an average of 83% of participants selecting the same answer across the two administrations. Finally, average scores computed within the three questions that contained Likert-type items (i.e., Q4=confidence, Q5=satisfaction and Q9=computer literacy coefficient alphas = .88, .77, .83) showed good test-retest reliability with average Pearson correlation coefficients:  $r = .81$  for Q4;  $.82$  for Q5, and  $.73$  for Q9. Further examination of concurrent validity between specific items showed that the confidence and satisfaction with notetaking scores measured by Q4 and Q5 were significant predictors of notetaking

strategies, especially whether or not participants indicated a need for improvement of their notetaking abilities.

### **Data Analysis**

All analyses were performed using the R Statistical Programming Language (R Core Team, 2018) with additional use of the following R packages: *psych* (Revelle, 2018) and *reshape2* (Wickham, 2007). The primary analytic approach was descriptive. For each of the items on the NASUS, descriptive statistics per time period were computed. Due to the exploratory nature of the study, and the number of items analyzed, inferential methods were not used to examine changes across time periods. It was not our intention to test hypotheses regarding change over time, but rather to record descriptive statistics at three time points. This approach was chosen because categorizing particular changes as significant institutes an arbitrary threshold and may inflate the probability of Type I errors (McShane et al., 2018). As such, we present the normative data culled at each of three time points and qualitatively describe the differences among reported levels of each response at each time point.

## **RESULTS**

### **Participants' Characteristics**

The majority of the 139 participants were full-time college freshmen students enrolled in introductory level science courses who identified as female. Most participants identified as White or Caucasian. Most of the sample reported being enrolled in a health-related major (e.g., pre-med, health sciences) with other reported majors being one of the following: engineering, biochemistry, biology or chemistry. The National Science Foundation defines STEM education as including natural sciences, computer and information sciences, engineering, mathematics as well as the social and behavioral sciences (Gonzalez & Kuenzi, 2012). STEM undergraduate areas of study include biology, biochemistry, chemistry, all biomedical fields, biopsychology, multiple specializations in engineering, technology, and mathematics (Fiegener, 2013). The mean age of participants was 18.43 (SD = 1.00) indicating that their ages were representative of traditional college freshmen and that they are of the iGen generation. One-hundred six participants reported taking the SAT prior to college, with an average self-reported score of 1249.93 (SD = 191.72) which places them in the 86th percentile nationally. Approximately 80% of participants reported that at least one of their parents had some college degree (i.e., associates, bachelors, masters or doctoral degree) with the majority having a bachelor's or master's degree (~64%). Participants were also asked about any diagnoses that may affect their learning with the most reported diagnoses being anxiety and depression; slightly more than half the participants explicitly reported having no disability. Table 1 provides further details about the characteristics of the study participants.

**Table 1** Participant Characteristics

Item	Frequency	Percentage
Gender Identity (n=137)		
Female	102	74
Male	34	25
Non-binary	1	0.7
Undergraduate Status (n=138)		
Freshman	101	73
Sophomore	24	17
Junior	8	6
Senior	5	4
Race (n=137)		
Asian	16	12
Black or African American	7	5
Hispanic or Latino	10	7
Pacific Islander or Native Hawaiian	2	1
White	57	41
Other	1	0.7
Academic Major (n=134)		
Architecture	7	5
Biology	12	9
Biochemistry	3	2
Biopsychology	1	0.7
Environmental Sustainability	1	0.7
Health Science/Athletic Training	2	1
Health Science/Nursing	11	8
Health Science/ Occupational Therapy	12	9
Health Science/ Physician Assistant	30	22
Industrial Design	1	0.7
Interior Design	3	2
Mechanical Engineering	3	2
Premedical Studies	36	27
Premedical Studies Accelerated	2	1
Psychology/Occupational Therapy	4	3
Other, unspecified	6	4
Parent Education Level (n=138)		
Less than high school/GED	8	6
High school diploma/GED	19	14
Associates degree	16	12
Bachelors degree	44	32
Graduate degree	44	32
Doctorate degree	6	4
Not applicable	1	0.7
Reported Diagnoses (n=121) *		
Attention Deficit Disorders (ADHD/ADD)	8	7
Anxiety	26	21
Blind or Vision Impaired	7	6
Chronic Health Condition	1	0.8
Deaf or Hard of Hearing	1	0.8
Depression	13	13
Learning Disability	2	2
Not Applicable	71	59

\*Some participants reported multiple diagnoses.

Along with their sociodemographic data, participants provided information about their study habits and how much time they worked for pay during a typical week in the semester. During the first week of the semester (Time 1), just over 62% of participants reported studying for 15-19 hours a week or less. The reported number of hours studying did not appreciably change at Time 2 (62%) nor Time 3 (65%). At Time 1, participants estimated spending an average of 2.54 (SD = 1.07) hours per week reviewing their notes, while the average at Time 2 was 3.02 (SD = 1.23) hours, and the average at Time 3 was 2.61 (SD = 1.08) hours. In terms of work, the majority of participants reported working

less than four hours a week for pay and this increased over the semester (Time 1: 56%, Time 2: 62%, Time 3: 68%). However, some participants reported working up to 24 hours a week per pay period. This increased from Time 1 to Time 3 (Time 1: 3%, Time 2: 6%, Time 3: 7%).

### **Notetaking Modality**

The first question participants answered about notetaking modality consisted of the 14 items shown in Table 2, along with the statement “I use another notetaking technique” to which participants could add other modality. Participants chose one of five options to indicate the percentage of time they used each modality in class: never, 1 to 25% of the time, 26-50% of the time, 51 to 75% of the time, and 76% of the time or more. Over 92% of participants responded “never” when asked if they used another notetaking modality, so that item is not shown in the table.

The table illustrates noteworthy tendencies among participants at all three time points. First, participants still seem to prefer handwriting their notes; at all three time points, about 60% of participants reported using this modality over three-quarters of the time. Second, items 4, 5, 9, and 10 all pertain to the use of technology such as video and audio recording, or specialized notetaking software (e.g., Sonocent, Evernote, and OneNote). A large majority of participants reported never using these modalities at all time points. However, participants did seem to be open to using audio recording devices as the semester progressed. Finally, though a small percentage of participants reported not taking notes, the vast majority of participants indicated that they “never” engaged in no notetaking at all three time points.

**Table 2** Participants' Report of the Percentage of Time Spent Engaging in Different Notetaking Modalities

Item	Time 1 (N = 139)					Time 2 (N = 92)					Time 3 (N = 74)				
	Never	1-25%	26-50%	51-75%	76%+	Never	1-25%	26-50%	51-75%	76%+	Never	1-25%	26-50%	51-75%	76%+
1. I handwrite my notes on printed PowerPoint™ Slides*	47**	27	9	7	10	57	20	8	3	13	61	1	11	9	7
2. I handwrite my notes on the handout provided by the instructor	8	30	25	25	12	15	27	28	17	12	26	22	23	24	5
3. I handwrite on my own notebook paper	0	5	12	17	66	1	2	11	14	72	8	3	10	19	60
4. I handwrite on a tablet PC or iPad	59	18	12	6	5	62	11	10	13	4	65	16	3	8	8
5. I audio record the lectures	81	12	4	2	1	65	14	10	8	3	64	8	11	7	11
6. I video record the lectures	91	7	1	1	1	87	7	3	2	0	91	5	0	4	0
7. I type my notes in Microsoft Word™, Google doc or other word processing software	23	20	19	17	21	25	17	13	21	23	34	16	23	12	14
8. I type my notes on the PowerPoint™ slides	64	22	4	7	3	57	20	10	7	7	60	9	12	15	4
9. I type my notes in the Sonocent software	99	1	0	0	0	83	8	5	3	1	77	9	5	4	4
10. I type my notes in the Evernote or OneNote Software	89	5	1	2	2	91	5	1	1	1	91	4	0	5	0
11. I type my notes on my phone	64	27	6	2	1	79	17	2	2	0	69	18	7	3	3
12. I take a picture of the notes written on the board	9	24	28	27	13	9	26	24	34	7	14	28	23	22	14
13. I copy someone else's notes	36	45	14	3	2	58	35	3	3	1	63	25	5	5	1
14. I have a person who take notes for me	96	4	0	1	0	98	1	1	0	0	93	3	1	3	0
15. I do not take notes during class	86	10	2	0	1	88	8	4	0	0	84	7	8	0	1

*Note.* \* Students indicated a single response for each item. \*\* These values represent the percentage of students who provided this response choice.

## Notetaking Strategies

The second question participants answered pertained to the specific strategies they did or did not use *while* taking notes. Participants were given a list of strategies (Table 3) and asked to check all that applied in response to the question “which notetaking strategies do you currently use regularly?” Table 3 lists the percentage of participants who did not check each item (“no”) and the percentage that did (“yes”).

A large majority of participants at each time point indicated that they regularly used abbreviations in their notes, and that they tended to summarize lecture material as it was presented to them. Despite the large majority of participants using abbreviations, about half reported still trying to write everything the instructor said at each time point. Participants also showed a preference for using either pictures or diagrams, highlighting, or underlining parts of their notes. This did not seem to change appreciably throughout the semester. However, there was an 11-point increase in the percentage of participants using diagrams from Time 1 to Time 2. About half of the participants reported using color coding schemes during notetaking.

**Table 3** Percentage of participants indicating that they use each of eight strategies while taking notes.

Item	Time 1 (N = 139)		Time 2 (N = 92)		Time 3 (N = 74)	
	No	Yes	No	Yes	No	Yes
1. I use abbreviations when taking notes*	32.37	67.63	28.26	71.74	28.77	71.23
2. I summarize the lecture as it is being presented	29.50	70.50	30.43	69.57	30.14	69.86
3. I try to write everything the instructor says	51.80	48.20	59.78	40.22	50.00	50.00
4. I compare notes with my classmates after class	76.26	23.74	80.43	19.57	84.93	15.07
5. I include pictures or diagrams in my notes	30.94	69.06	19.57	80.43	24.32	75.68
6. I highlight parts of my notes	28.06	71.94	30.43	69.57	37.84	62.16
7. I underline parts of my notes	19.42	80.58	16.3	83.70	18.92	81.08
8. I color code my notes	57.55	42.45	56.52	43.48	57.53	42.47

Note. \* Participants could select (i.e., Yes) as many notetaking techniques as they used.

## Engagement with Ones' Notes

### Use of Notes

An important aspect of understanding notetaking practices of freshman STEM students is to learn about how they use their notes, an aspect of engagement. Participants were asked to check-all-that-apply from an exhaustive list of strategies that they could use to engage with the notes taken in class. Table 4 lists the type of use along with the percentage of participants who checked each one (“yes”). Not surprisingly, nearly three-quarters of the participants indicated the use of flashcards as a strategy to engage with their notes. Interestingly, the distribution of ways to use their notes at Time 2 shifted to include a wider array of strategies used by a majority of participants. Flashcard use still dominated the strategies (~78% of participants), but there were upticks in the percentages of participants who indicated annotating their notes (“writing connections”), explaining information out loud, and using diagrams or models. A small percentage of participants reported comparing notes with classmates after class (Table 3). Finally, while nearly all participants reported *not* using a tutor to aid their studying at Time 1, 25% of them indicated that they *did* seek tutoring at Time 2, while ~16% reported doing so at Time 3.

**Table 4** Percentages of each of eight strategies used to engage with one's notes.

Item	Time 1 (N = 139)		Time 2 (N = 92)		Time 3 (N = 74)	
	No	Yes	No	Yes	No	Yes
1. I create flash cards (e.g., paper, Quizlet)	30.43	69.57	21.74	78.26	31.08	68.92
2. I create test questions to assess my own learning	78.99	21.01	77.17	22.83	58.11	41.89
3. I write all the information that I recall on a blank piece of paper to assess my own learning	71.01	28.99	56.52	43.48	59.46	40.54
4. I write connections in my notes using the textbook, other readings and materials, classroom discussion, problem sets, etc.	57.25	42.75	38.04	61.96	48.65	51.35
5. I explain the information in my notes out loud	42.75	57.25	32.61	67.39	40.54	59.46
6. I create mnemonics, sayings, songs or games	57.97	42.03	46.74	53.26	54.05	45.95
7. I draw and label diagrams, models, etc.	42.03	57.97	22.83	77.17	31.08	68.92
8. I review my notes with a tutor	94.20	5.80	75.00	25.00	83.78	16.22

### Primary reason for taking notes

The literature tells us that the reasons for taking notes is important and related to how students will use their notes (i.e., engagement). The next question participants answered pertained to their reasons for taking notes. Participants were given a list of five reasons for taking notes, and asked to check all that applied in response to the question “What are your primary reasons for taking notes?” Table 5 lists the five reasons along with the percentage that did (“yes”) and did not (“no”) check each item. While each item was indicated as a primary reason for notetaking by robust majorities of participants at each time point, they were nearly unanimous about using notetaking as a memory aid. Specifically, between 93 and 97% of participants indicated that they took notes to help them remember information presented in class. The results were similar in terms of having a resource for studying. Participants also reported taking notes to understand material, though the percentage of participants answering no to that reason was higher than the “remember information” item.

**Table 5** Percentages of participants indicating each of five primary reasons for taking notes.

Item	Time 1 (N = 139)		Time 2 (N = 92)		Time 3 (N = 74)	
	No	Yes	No	Yes	No	Yes
1. To help me pay attention in class	28.78	71.22	27.17	72.83	24.32	75.68
2. To help me remember information shared in class	5.76	94.24	3.26	96.74	6.76	93.24
3. To help me understand the information shared in class	10.79	89.21	13.04	86.96	13.51	86.49
4. To have as a resource to complete course assignments	24.46	75.54	18.48	81.52	25.68	74.32
5. To have as a resource to study for quizzes and/or exams	8.63	91.37	5.43	94.57	10.96	89.04

### Confidence

Two aspects of confidence were investigated in this study: confidence with notetaking and confidence with using computers.

#### *Confidence in Notetaking Practices*

Participants were asked a series of 11 questions related to their confidence with different aspects of their notetaking practices on a 6-point scale (1=Strongly Disagree, to 6=Strongly Agree). A median score for the 11 questions was computed for each participant at each data point. Participants, on average, have fair confidence in their notetaking abilities and this confidence changes by 0.5 point over time with the lowest average at Time 2 [Time 1 Mean = 4.57 (SD = 0.88); Time 2 = Mean 4.06 (SD = 0.93); Time 3 Mean = 4.91 (SD = 1.07)]. This pattern of change in the average median scores remains similar when only participants for whom we had complete data set across all three data points were included [n=56; Time 1 Mean = 4.49 (SD = 1); Time 2 Mean = 4.54 (SD = 0.92); Time 3 Mean = 4.89 (SD = 1.12)] with the exception of the second datapoint which does not show a dip in confidence. The percentage of participants whose median confidence score across all questions was 4 or above (4 being the lowest score on the confidence side of the Likert scale) was also computed. At Time 1,



57.97% of participants met this criteria, at Time 2 59.09%, and at Time 3 68.66%. The first of the 11 questions asked participants to rate their overall confidence in their notetaking abilities (i.e., “I am confident in my note-taking abilities”). To ascertain the relationship between the remaining questions and the overall confidence question, a linear regression analysis was performed. All the questions were moderately correlated (0.556- 0.65) with the first question as expected since they captured different aspect of notetaking confidence. The  $R^2$  value ranged from 0.31-0.42 with questions 2 “I feel I am writing or typing everything I need during class” and 6 “My notes are detailed” each explaining 17.64% of the overall confidence. Question 10, “My notes are useful when I study for quizzes or exams” explained 16% of the variation in overall confidence.

### ***Ways to Improve Own Notes***

To learn more about the underlying reasons behind participants’ perception of their notetaking abilities (i.e., confidence), they then answered a question that provided a list of ways they might like to improve their notes. They were asked to check all that applied. Table 6 lists each of the improvements with “no” corresponding to the percentage of participants not checking an item in the list, and “yes” corresponding to the percentage of participants who checked that item. Participants seem to find their own notes legible as a majority of them did not indicate that they wanted to improve the legibility of their notes at each time point. There was mixed support for all other improvements except time-efficiency. At the start of the semester, just over 70% of participants desired to make their notes more time efficient, however, the percentage dropped five points at each additional time point.

**Table 6** Percentages of students indicating each of eight different “ways to improve” their notetaking.

Item	Time 1 (N = 139)		Time 2 (N = 92)		Time 3 (N = 74)	
	No	Yes	No	Yes	No	Yes
1. Legible	74.82	25.18	81.52	18.48	83.78	16.22
2. Helpful	54.68	45.32	51.09	48.91	68.92	31.08
3. Accurate	63.31	36.69	61.96	38.04	72.97	27.03
4. Complete	50.36	49.64	57.61	42.39	62.16	37.84
5. Concise	44.60	55.40	41.30	58.70	47.30	52.70
6. Clear	58.27	41.73	59.78	40.22	67.57	32.43
7. Organized	48.20	51.80	48.91	51.09	56.76	43.24
8. Time-efficient	29.50	70.50	34.78	65.22	41.89	58.11

*Note.* Students could check all that applied.

### ***Use of Software and Computer Confidence***

A final set of four items was designed to gauge the confidence of participants in relation to the use of software and computer (i.e., 6-point scale from 1 = strongly disagree to 6 = strongly agree). This was given to assess whether or not participants felt confident in their computer skills as this may impact someone’s notetaking modality preference. Table 7 gives the results of the competence set of items. Not surprisingly, on average, participants reported being able to download software, and indicated relatively high confidence in their ability to learn to use new software. They also reported relatively high confidence in their general computing skills. In contrast, the interest in learning new learning technologies dropped across the time periods.

**Table 7** Participants' Confidence with their Ability to Use Software and Computers

Item	Time 1 (N = 139)		Time 2 (N = 92)		Time 3 (N = 74)	
	M	SD	M	SD	M	SD
1. I am interested in learning to use new technologies.	4.32	1.35	3.57	1.51	3.50	1.45
2. I can download software on my computer.	4.80	1.40	4.6	1.23	4.73	1.47
3. I am confident in my ability to learn how to use new software.	4.49	1.40	4.34	1.44	4.47	1.54
4. I am confident in my ability to learn new computer skills.	4.56	1.43	4.43	1.35	4.59	1.43

## DISCUSSION

The present study investigated freshman STEM students' notetaking practices, specifically, modalities and strategies used as well as degree of engagement and confidence with their own notes. The sample represented a typical college-age sample of iGen freshmen who were high achieving based on their reported SAT scores. In addition, these students reported studying regularly during most weeks; most had only part-time jobs or no employment responsibilities; and they reported reviewing notes about three hours per week during the semester.

In terms of modality, the iGen STEM students in this study still clearly prefer to handwrite their notes, and this preference persists throughout their first semester of college (see Table 2). The findings of this study are consistent with the recent findings of Morehead et al. (2019) and Witherby & Tauber (2019) who reported that most college students take handwritten notes. It is noteworthy that in now three recent studies, including ours, handwritten notes were the most commonly used notetaking modality, yet other studies found that taking digital notes were more enjoyable and convenient than handwritten notes (Aguilar-Roca et al., 2012; Gose, 2017; Luo et al., 2018). It is unclear what causes the difference between most commonly used notetaking modality (i.e., handwritten) and modality that is most enjoyable or convenient (i.e., digital notetaking). This difference is likely not caused by participants lacking computer skills since participants in this study reported knowing how to download software and had high confidence in their ability to learn to use new software. This reported confidence did not result in an interest to learn new software or the use of specialized notetaking software. This is inconsistent with previous studies (Rue, 2018; Schepman et al., 2012) which found that students preferred the use of specialized notetaking software (i.e., Evernote) to assist with coursework and the assumption made that iGen students' comfort with technology equates with a preference for digital notetaking.

The students in the current study reported employing a variety of different notetaking strategies throughout the semester with abbreviations, highlighting, and diagrams being commonly used (see Table 3). The notetaking strategies reported to be most commonly used by these participants are, thus, visual in nature. This is not surprising since STEM students use diagrams in learning, and iGen students tend to use visual imagery as a learning strategy (Manalo et al., 2013; Shatto & Erwin, 2016). While the use of highlighting and underlining did not change much over the semester, there was an increase in participants using diagrams, perhaps in response to the requirements of their STEM courses. This is positive since the use of visuals within notes is a strategy that has been found to help students engage with learning (Luo et al., 2018; Ramsay & Sperling, 2011).

The effectiveness of verbatim transcription as a notetaking strategy has been questioned in past studies (Luo et al., 2018; Mueller & Oppenheimer, 2014). Approximately 70% of participants in this study reported summarizing lectures in their notes whereas ~50% reported attempting to capture everything their instructors say (i.e., verbatim notes). This was consistent with findings from Bonner and Holliday (2006), who also found nearly fifteen years ago that 50% of students attempted to copy what instructors said verbatim. An objective evaluation of the degree of actual verbatim nature of the notes, compared to what the instructor said, was not assessed as part of this study.

As mentioned in the background, engagement with one's notes (e.g., making flashcards) is essential for true learning to occur (Ramsay & Sperling, 2011). The participants in this study reported

using a variety of strategies that have been associated in the literature with engagement with notes. Flashcards was used by most participants (e.g., ~70% at time one), followed by “explaining the information in my notes” and “draw and label diagrams,” both used by ~57% of the sample at Time 1 (see Table 4). This is consistent with a finding from Morehead et al. (2019) that half of the students reported using flashcards. As the semester progressed, slight variations (1-10%) in engagement strategies used were found for most items (see Table 4). Given the decrease in sample size, it is unclear whether these small variations are reflective of a real change during the first semester. Participants reported an increase of ~20% in “create test questions” between the first and third data point which was expected since the latter data point was just a couple of weeks before final exams. A ~10-12% increase was also found in “reviewing notes with a tutor”, “drawing and labeling diagrams” and “writing all the information recalled” between the first and third datapoint (Table 4), although “reviewing notes with a tutor” was by far used by the fewest number of participants at any point in time. Graham (2018) suggests that iGen students may have difficulty engaging with their notes, which does not seem substantiated by the self-report engagement rates found in this study. A future study which would analyze objectively the quality of the participants’ notes will allow confirmation or refutation of this assumption.

When asked about their confidence with different aspects of their notetaking, participants indicated a fair confidence in their abilities. This confidence was lowest at Time 2, which happened to be the timing of midterm exams, but increased again by Time 3, the timing of final exams at the end of their first college semester. Self-report of the completeness of notes and usefulness of notes to study for exams explained the 16-17% of overall confidence in notetaking abilities.

Related to confidence in notetaking skills, participants indicated whether they intended to improve their notes across a number of parameters (e.g., legibility, helpfulness, accuracy; see Table 6). Few participants were concerned about their notes’ legibility (< 20% by Time 2); whereas for most other parameters, ~50% of the sample was interested in making improvements. Time efficiency of notetaking was the exception with 70% of participants at Time 1 reporting that they wanted to be more efficient in notetaking. However, this percentage dropped at each data point, perhaps suggesting that participants were improving their notetaking efficiency throughout the semester. In fact, across all eight parameters upon which participants could wish to improve, there was a decrease in concerns from the start to the end of the semester. This is consistent with previous studies which found that 96% of students stated that their notetaking skills improved during their time in college, as they changed their strategies to meet the demands of their courses (Bonner & Holliday, 2006; Van Meter et al., 1994). The dichotomy found in this study between confidence in notetaking skills and desire to improve notetaking skills, is in line with studies from Whiterby and Tauber (2019) and Morehead et al., (2019) who found that despite having confidence in their notetaking abilities, participants expressed a desire to improve their skills and participate in skill building workshops.

### ***Limitations***

The study sample was drawn from a single university with students who are primarily high achieving in terms of SAT scores and come from white college educated families. Generalization to students with other characteristics should be done cautiously. The sample was STEM freshman students in their first semester of college. Although the initial sample size was substantial (n=139), there was attrition at each time point, and some participants contributed data at non-adjacent time points. In addition, the psychometric structure of the questions within the NASUS is not currently known, which precludes the use of summary scores to form grouping variables. However, given the dearth of research on notetaking practices, there is value in providing descriptive statistics over three time periods. Any inferences about the changes in notetaking practices across time-points should be made with caution. Despite this, we see the analysis as valuable from a normative perspective, which may be helpful for researchers and practitioners alike. That is, we present information about self-reported notetaking practices of iGen STEM students that, to our knowledge, was not available prior to our analysis. Finally, while participants were encouraged to be as honest and truthful as possible, it may be difficult for them to accurately report their notetaking practices. The latter limitation is shared

by other studies relying on self-report data. Given the consistency among current and past results, it is not likely that this is a major concern. A study combining self-report and objective measures of note quality may be useful in explaining some of the differences between this study and previous studies.

## CONCLUSION

The study found that most iGen STEM students take handwritten notes a majority of the time, which remains consistent throughout their first semester in college. They use a variety of strategies when taking notes such as highlighting and diagramming. They report a higher rate of summarizing lectures compared to attempting verbatim transcription of what is said during a lecture. Participants used a variety of note review strategies with flash cards being by far the most popular early in the semester. Participants appear to employ a greater number of strategies to review their notes as the semester evolves. Participants are reporting wanting to improve their notes across most of the parameters studied, but their wish to improve their notes decreases over the semester. Efficiency of notetaking was the parameter that participants most wanted to improve early in the semester. Overall, the iGen STEM freshman in this study reported engaging in notetaking behaviors that is conducive to increased quality of notes and greater learning. This study does provide preliminary evidence that freshmen STEM students actively adjust the ways in which they use their notes as their first semester unfolds. Future studies could investigate this theory through a well-designed cross-sectional or longitudinal study.

## DECLARATIONS

**Conflicts of Interest:** No potential conflict of interest was declared by the authors.

**Funding Details:** The survey design, testing, data collection, data entry and initial manuscript preparation were partially funded through an internal university grant combined with department research funds.

**CRedit Author Statement:** Author 1: Conceptualization, Writing- Original Draft Preparation, Reviewing, Editing, Methodology, Supervision

Author 2: Conceptualization, Writing- Original Draft Preparation and Final Draft Preparation/Submission, Methodolgy, and Investigation

Author 3: Writing- Literature Review

Author 4: Data Analysis and Writing of Results section

Author 5: Conceptuatlization, Investigation and Data Checking

Author 6: Conceptualization and Investigation

**Ethical Statement:** Ethical approval was obtained from the Philadelphia University Institutional Review Board (Protocol Number: PU18-39) prior to research activities.

## REFERENCES

- Aguilar-Roca, N. M., Williams, A. E., & O'Dowd, D. K. (2012). The impact of laptop-free zones on student performance and attitudes in large lectures. *Computers & Education*, 59(4), 1300-1308. <https://doi.org/10.1016/j.compedu.2012.05.002>
- Annis, L. F. (1981). Effect of preference for assigned lecture notes on student achievement. *The Journal of Educational Research*, 74(3), 179-182
- Bonner, J. M., & Holliday, W. G. (2006). How college science students engage in note-taking strategies. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, 43(8), 786-818. <https://doi.org/10.1002/tea.20115>
- Boyle, J. R., Forchelli, G. A., & Cariss, K. (2015). Note-taking interventions to assist students with disabilities in content area classes. *Preventing School Failure: Alternative Education for Children and Youth*, 59(3), 186-195. <https://doi.org/10.1080/1045988X.2014.903463>
- Bui, D. C., Myerson, J., & Hale, S. (2013). Note-taking with computers: Exploring alternative strategies for improved recall. *Journal of Educational Psychology*, 105(2), 299. <https://doi.org/10.1037/a0030367>
- Carrier, C. A., Williams, M. D., & Dalgaard, B. R. (1988). College students' perceptions of notetaking and their relationship to selected learner characteristics and course achievement. *Research in Higher Education*, 28(3), 223-239. <https://doi.org/10.1007/BF00992232>
- Chabot, M., Potvin, M.C., Hass, R., Garrity, A., & Bower, A. (2021). Development, preliminary validation, and reliability of the Notetaking Abilities and Strategies of University Students (NASUS) Questionnaire. *Department of Occupational Therapy Faculty Papers*, Paper 81. <https://jdc.jefferson.edu/otfp/81>
- Chen, P. H., Teo, T., & Zhou, M. (2017). Effects of guided notes on enhancing college students' lecture note-taking quality and learning performance. *Current Psychology*, 36(4), 719-732. <https://doi.org/10.1007/S12144-016-9459-6>
- Fiegner, M. K. (2013). Science and engineering degrees: 1966-2010. *National Center for Science and Engineering Statistics. National Science Foundation*, 3-327.
- Fried, C. B. (2008). In-class laptop use and its effects on student learning. *Computers & Education*, 50(3), 906-914. <https://doi.org/10.1016/j.compedu.2006.09.006>
- Gonzalez, H. B. & Kuenzi, J. J. (2012). Science, Technology, Engineering, and Mathematics (STEM) Education: A Primer. *Congressional Research Service*. <https://fas.org/sgp/crs/misc/R42642.pdf>
- Gose, B. (2017). Gen Z changes the debate about devices in the classroom. *The Chronicle of Higher Education*, 64(4). <https://www.chronicle.com/article/a-new-generation-of-digital-distraction>

- Graham, L. P. (2018) Generation Z goes to law school: Teaching and reaching law students in the post-millennial generation. *University of Arkansas at Little Rock Law Review*, 41(1), 29. <https://ssrn.com/abstract=3271137>
- Hembrooke, H., & Gay, G. (2003). The laptop and the lecture: The effects of multitasking in learning environments. *Journal of Computing in Higher Education*, 15(1), 46-64. <https://doi.org/10.1007/BF02940852>
- Kim, H. (2018). Impact of slide-based lectures on undergraduate students' learning: Mixed effects of accessibility to slides, differences in note-taking, and memory term. *Computers & Education*, 123, 13-25. <https://doi.org/10.1016/j.compedu.2018.04.004>
- Luo, L., Kiewra, K. A., Flanigan, A. E., & Peteranetz, M. S. (2018). Laptop versus longhand note taking: Effects on lecture notes and achievement. *Instructional Science*, 46(6), 947-971. <https://doi.org/10.1007/s11251-018-9458-0>
- Luo, L., Kiewra, K. A., & Samuelson, L. (2016). Revising lecture notes: how revision, pauses, and partners affect note taking and achievement. *Instructional Science*, 44(1), 45-67. <https://doi.org/10.1007/s11251-016-9370-4>
- Manalo, E., Uesaka, Y., Pérez-Kriz, S., Kato, M., & Fukaya, T. (2013). Science and engineering students' use of diagrams during note taking versus explanation. *Educational Studies*, 39(1), 118-123. <https://doi.org/10.1080/03055698.2012.680577>
- McGuire, S. (2015). *Teach students how to learn: Strategies you can incorporate into any course to improve student metacognition, study skills, and motivation*. Stylus Publishing.
- Morehead, K., Dunlosky, J., Rawson, K. A., Blasiman, R., & Hollis, R. B. (2019). Note-taking habits of 21<sup>st</sup> century college students: implications for student learning, memory, and achievement. *Memory*, 27(6), 807-819. <https://doi.org/10.1080/09658211.2019.1569694>
- Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard: Advantages of longhand over laptop notetaking. *Psychological Science*, 25(6), 1159-1168. <https://doi.org/10.1177/0956797614524581>
- National Research Council. (2012). *Discipline-based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering*. National Academies Press.
- Palmatier, R. A., & Bennett, J. M. (1974). Notetaking habits of college students. *Journal of Reading*, 18, 215-218.
- Peverly, S. T., Vekaria, P. C., Reddington, L. A., Sumowski, J. F., Johnson, K. R., & Ramsay, C. M. (2013). The relationship of handwriting speed, working memory, language comprehension and outlines to lecture note-taking and test-taking among college students. *Applied Cognitive Psychology*, 27(1), 115-126. <https://doi.org/10.1002/acp.2881>
- Portney, L.G. & Watkins, M.P. (2009). Descriptive research. In L.G. Portney & M.P. Watkins (Eds.), *Foundations of Clinical Research: Applications to Practice* (3<sup>rd</sup> ed.). Pearson Prentice Hall.

- Quade, A. Q. (1996). An assessment of retention and depth of processing associated with notetaking using traditional pencil and paper and an on-line notepad during computer-delivered instruction. In M. R. Simonson, M. Hays, & S. Hall (Eds.), *Proceedings of Selected Research and Development Presentations at the 1996 Convention of the Association for Educational Communications and Technology* (pp. 559–570).
- R Core Team. (2018). *R: A language and environment for statistical computing*. <https://www.R-project.org>
- Ramsay, C. M., & Sperling, R. A. (2011). Exploring main idea generation via electronic note-taking. *Journal of Literacy and Technology*, 12(1), 26-64.
- Revelle, W. (2018). *Psych: Procedures for Personality and Psychological Research*. Northwestern University. <https://cran.r-project.org/web/packages/psych/index.html>
- Rue, P. (2018). Make way, millennials, here comes Gen Z. *About Campus: Enriching the Student Learning Experience*, 23(3), 5-12. <https://doi.org/10.1177/1086482218804251>
- Schepman, A., Rodway, P., Beattie, C., & Lambert, J. (2012). An observational study of undergraduate students' adoption of (mobile) note-taking software. *Computers in Human Behavior*, 28(2), 308-317. <https://doi.org/10.1016/j.chb.2011.09.014>
- Shatto, B., & Erwin, K. (2016). Moving on from millennials: Preparing for generation Z. *The Journal of Continuing Education in Nursing*, 47(6), 253-254. <https://doi.org/10.3928/00220124-20160518-05>
- Skolnik, R., & Puzo, M. (2008). Utilization of laptop computers in the school of business classroom. *Academy of Educational Leadership Journal*, 12(2), 1-10. <https://doi.org/10.13140/RG.2.1.3218.6962>
- Stacy, E. M., & Cain, J. (2015). Note-taking and handouts in the digital age. *American Journal of Pharmaceutical Education*, 79(7), 107. <https://doi.org/10.5688/ajpe797107>
- Stains, M., Harshman, J., Barker, M.K., Chasteen, S. V., Cole, R., DeChenne-Petters, S.E., ...& Young, A.M. (2018). Anatomy of STEM teaching in North American universities. *Science*, 359(6383), 1468-1470. <https://doi.org/10.1126/science.aap8892>
- Wickham, H. (2007). Reshaping data with the reshape package. *Journal of Statistical Software*, 21(12), 1-20. <https://doi.org/10.18637/jss.v021.i12>
- Witherby, A. E., & Tauber, S. K. (2019). The Current Status of Students' Note-Taking: Why and How Do Students Take Notes?. *Journal of Applied Research in Memory and Cognition*, 8(2), 139-153. <https://doi.org/10.1016/j.jarmac.2019.04.002>
- Wurst, C., Smarkola, C., & Gaffney, M. A. (2008). Ubiquitous laptop usage in higher education: Effects on student achievement, student satisfaction, and constructivist measures in honors and traditional classrooms. *Computers & Education*, 51(4), 1766-1783. <https://doi.org/10.1016/j.compedu.2008.05.006>

Van Meter, P., Yokoi, L., & Pressley, M. (1994). College students' theory of note-taking derived from their perceptions of note-taking. *Journal of Educational Psychology*, 86(3), 323. <https://doi.org/10.1037/0022-0663.86.3.323>



## Eliminating Reading Difficulty in an Elementary 4th Grade Student Based on Learning Style\*

**Metin Gül<sup>i</sup>**

Gazi University

**Olca Özdemir<sup>ii</sup>**

Zonguldak Bülent Ecevit University

### Abstract

This study determines and corrects reading mistakes made during oral reading by a fourth grader with reading difficulty, and examines the effects of learning styles in reading comprehension development. Designed with the action research method, the study was conducted with a student from a state primary school in one of the city of Black Sea region selected in line with the purpose of the study. In the determination of the student participating in the research, "critical situation sampling" method which is one of the purposeful sampling methods, was used. Even though the student had no mental, auditory or visual insufficiency, her reading comprehension success is under peer averages, experienced a lot of difficulty and made many mistakes during oral reading. The study conducted with this student experiencing reading difficulty lasted 49 hours over twelve weeks. According to the Marmara Learning Styles Scale, the student's dominant learning preference is "tactile learning style". Therefore, the student's sense of touch was engaged with word box strategy, sandpit activity and the method of dictation. In order to improve his reading comprehension skill, the story mapping method was used. As a result of the 49-hour practice, the grade 2 word recognition and reading comprehension level rose from the "Frustration Level" to grade 4 word recognition and reading comprehension level known as the "Independent Level". The story mapping method is rather successful in developing the reading comprehension success of students with reading difficulty. The results of the study revealed that reading difficulty can be eliminated with reading practice based on learning styles.

**Keywords:** Fluent Reading, Story Mapping Method, Reading Difficulty, Learning Styles

**DOI:** 10.29329/ijpe.2023.534.2

**Submitted:** 13/03/2022

**Accepted:** 20/03/2023

**Published:** 01/04/2023

---

\* This study was derived from the master's thesis prepared by the first author under the supervision of the second author.

<sup>i</sup> **Metin Gül**, PhD Student, Gazi Faculty of Education, Gazi University, ORCID: 0000-0003-2388-6927

**Correspondence:** metinngul@gmail.com

<sup>ii</sup> **Olca Özdemir**, Assist. Prof. Dr., Faculty of Education, Department of Basic Education, Zonguldak Bülent Ecevit University, ORCID: 0000-0002-0846-9546

## INTRODUCTION

Reading is a crucial skill in meeting basic daily needs, academic and personal development, and social adaptation (Akyol, 2014; Edward et al., 2014). It comprises the first stage of learning. Merely vocalizing letters is not adequate for reading. The real purpose of reading is to comprehend what has been read and to express what has been understood (Akyol, 2014). Students who acquire reading skills can learn new information by reaching different sources. The goal of the Turkish curriculum is to enable individuals to read texts fluently and accurately, to read critically and question what has been read, and to make a habit of reading (MEB, 2020).

Reading and reading comprehension are among the most basic goals of education so that individuals can adapt to information age and continue their lifelong learning. In the advanced societies of our day, being able to write one's name and last name is not considered as literacy to create technology. Therefore, literacy programs should develop well-equipped, thinking and questioning readers who help advance their societies (Akyol, 2015).

### Fluent Reading

Fluent reading refers to recognizing words and making meaning of sentences quickly and accurately (Bender, 2012). An important issue in reading is the development of fluent reading. Fluency acts like a bridge between word recognition and reading comprehension (Edward et al., 2014). One of the most important objectives of teaching reading skills is undoubtedly to support individuals as they acquire fluent reading skills (Yıldırım et al., 2015).

Fluent reading refers to the ability of readers to read words in a text automatically, effortlessly and effectively with a meaningful expression that enhances the meaning of the text. Fluency is about taking words and word recognition to the next level. Many readers can decode words correctly but cannot be fluent or automatic in word recognition. As these readers use most of their limited mental energy on pronunciation, they have to spend less time on comprehension, therefore leaving meaning lagging behind. Therefore, insufficient fluency often leads to insufficient understanding. Conversely, fluent readers can read words accurately and effortlessly, and recognize words and sentences upon seeing them. They spend only a small amount of cognitive energy to decode words. It is obvious that a reader like this can use more of their cognitive energy on text comprehension. Immediate recognition enables meaning-making as the reader moves on to the next step (Rasinski, 2003).

At the same time, another important element in fluent reading training, which is frequently forgotten in some programs, is prosody or reading with expression. An important part of oral fluent reading is the skill of reading with the right expression. Fluent readers increase and decrease their level and tone of voice. They speed up or slow down at proper parts of the text. They read words in meaningful groups or sentences. They pause at appropriate points in the text. These are all elements of expression, or what linguists call prosody. Failures in reading often include inaccurate, slow and non-fluent word reading. These failures are often called reading difficulties (dyslexia) (Breznitz, 2006; Rasinski, 2003).

### Reading Difficulty

Despite having normal or above-normal intelligence, people may have difficulties in learning areas such as reading, writing or mathematics, as well as performing other tasks. This is referred to as specific learning disability. Reading difficulty is known as dyslexia; writing difficulty is known as dysgraphia; difficulty in learning mathematics is known as dyscalculia; and difficulty in physical coordination is known as dyspraxia (Clark et al., 2015; Høien & Sundberg, 2000; Reid & Green, 2014).

The inability of an individual with no mental or speech problems in reading a text is called "text blindness" by German neurologist Kusmaul (1987), "dyslexia" by Berlin (1887), "congenital

word blindness” by Dr. Morgan (1896) and Hinshelwood (1917), “developmental word blindness” by Orton (1925), “minimal brain dysfunction” by Yiğiter (2005), “learning difficulty” by Kirk and Bateman (1962) and “developmental neurological disease” by Eroğlu (2020). Brain-based research by neurologists make significant contributions to the understanding of the concept of reading difficulty.

For reading difficulty, Haris and Sipay (1990) used the terms “reading difficulty”, “reading disability” or “reading disorder”. The many terms that exist in the literature show that it is hard to define the limits of the concept of reading difficulty. When the terms are examined, although there may be differences among medical, educational and other institutions, their common point is the difficulties in recognizing words. When the studies on reading difficulties are examined, a child who could not read or write words correctly despite not having any health problems was diagnosed with “congenital word blindness” (Morgan, 1896). The difficulty was therefore seen as a sight problem. Today’s research, however, reveals that reading requires a mental process (Akyol, 2014) and that the brain has a special system to recognize and attach meaning to words (Dehaene, 2014).

Difficulties experienced by children can be pinpointed through the inadequacies that arise with their performance in academic fields when they start elementary school; however, certain clues that are the precursors of reading difficulties may also be observed in children's pre-school years. These include developmental delay, not understanding instructions, difficulty concentrating, and an inability to acquire early literacy skills (Santrock, 2018). However, children who display these symptoms should not be directly diagnosed with reading difficulty, and the process should be observed. It is critical to decide on early intervention for the child after examining the symptoms and observing, monitoring and evaluating the process. Research also shows that early diagnosis of and intervention in reading difficulty have significant results in improving children's reading success (Shaywitz, 2003; Torgesen, 2002).

The early indicators of reading difficulty include difficulty in concentration, failure to retain information, problems processing information, low motivation and interest in tasks, inability to understand instructions, inadequate vocabulary, insufficient writing and sound awareness, and listening comprehension problems (Kuruyer & Özdemir, 2019).

As children with reading difficulties have insufficient letter and sound matching skills, they cannot read aloud accurately by entering the sound structure of the word (Shaywitz, 2003). They therefore fail at reading (Kocnower et al., 1983). As children with underdeveloped word recognition skills cannot sound words accurately, they also have problems in comprehension (Cain, 2010; Torgesen, 2002).

Neurologist Orton (1925) has listed the following properties for individuals with reading difficulty:

1. Rotating letters such as ‘u’ and ‘n’ and numbers such as ‘6’ and ‘9’,
2. Reversing the word ‘no’ as ‘on’, or the number ‘48’ as ‘84’,
3. Confusing short words; for example, reading ‘of’ as ‘if’.
4. Misreading words; for example, misreading ‘reading’ as ‘leading’.
5. Skipping over words or sentences when reading,
6. Confusing words that sound similar,
7. Speaking late,
8. Being unable to say tongue twisters, rhyming words,

9. Having problems in word recognition (not recognizing letters, syllables and words)
10. Having difficulty in writing,
11. Not being able to choose appropriate words when speaking.

According to Shaywitz (2003), the following are symptoms of a dyslexic child:

1. Having difficulty reading words,
2. Having difficulty sounding meaningless or unfamiliar words accurately (alphabetic principle, decoding, phonics, sounding out),
3. Making mistakes and having difficulty during oral reading,
4. Reading very slowly,
5. Mispronouncing words that are being read.

Children with reading difficulties have problems matching letters and sounds. Research on elementary school children have shown that the most important indicator of reading success is phonological awareness (Habib, 2000). It was found that when students who have difficulty reading gain phonological awareness, they develop accurate oral reading skills (Alexander et al., 1991). Phonological decoding is the matching of letters and sounds, and reading aloud correctly (Shaywitz, 2003). Students' word recognition skills are determined by the skill of accurately reading nonsensical words.

Students with reading difficulty spend a long time on word recognition and word discrimination processes; cannot pronounce words correctly, read rather slowly, and have difficulty in grasping what they read and consequently cannot make meaning (Kuruyer & Özdemir, 2019; Yılmaz, 2008). Reading difficulty negatively affects students' academic and daily lives (Çayır & Balcı, 2017). For this reason, it is essential to identify children with reading problems early and to take appropriate interventions to eliminate their problems (Kuruyer & Özdemir, 2019).

### **Reading Mistakes**

Students with reading difficulties make various reading mistakes while reading. Their reading speed is also lower than their peers. They read words slowly, by pausing, and incorrectly. Some of the problems they experience during reading include "reversing, skipping, adding and repeating" (Akyol, 2015). Mistakes made during reading and their reasons are as follows:

### **Skipping and Additions**

Addition mistakes are made less frequently than other reading mistakes and do not distort the overall meaning. If there are not too many addition mistakes and they do not distort the meaning, there is no need for much concern as these will not affect reading comprehension too much by themselves. Skipping mistakes can be seen in letters, syllables or entire words. Letter and syllable skipping usually occurs in the middle or end of words. The underlying causes of these mistakes may be reading quickly, careless reading, and word and letter recognition deficiencies (Akyol, 2015).

### **Reversals**

One of the most common mistakes in elementary school, especially in the first grade, is reversals. Letters can be confused and reversed by children. The mistake of a student reading "d" as "b" is an example of letter reversal. Similarly, a student reading the word "no" as "on" has made the

mistake of word reversal. The mistake of reversal can occur in words as well. After the reading skill is mastered, these mistakes can be eliminated in a short while (Akyol, 2015).

### **Repetitions**

The most important reason for repetitions is deficiency in word recognition skills. It may also be a bad habit acquired by the child. If a child keeps making the mistake of repetition while reading the material at their grade level, then their reading practice should involve lower level materials. If repetitions are significantly reduced, the problem may be word recognition (Akyol, 2015). If repetitions are not reduced but still continue, the problem may be more complex than word recognition alone. In order to overcome this habit, the student may be asked to read words more carefully while reading (Özkara, 2010).

### **Eliminating Reading Difficulty**

Several different methods and strategies are used to eliminate the reading difficulties of individuals with reading difficulties. These methods and strategies are wordbox strategy (Joseph, 2002), repeated reading technique (Rosenberg, 1986), Carbo recorded book method (Bender & Larkin, 2003), 3P method (pause, prompt, praise) (Merret, 1998), echo reading (Carbo, 1996), choral reading (Richek, 2002), paired reading (Edward et al., 2014) and the neurological impress method (NIM) (Heckelman, 1969). 3P method consists of the feedback given by the teacher to the student in the form of “pause, prompt and praise”. In echo reading, while the teacher follows the student’s reading process, the teacher reads a small part of it aloud, and this practice proceeds until the texts are finished (Carbo, 1996). In choral reading, a group of students choose the text and read it aloud in chorus by working with a teacher. This method encourages students to learn vocabulary. As for paired reading, it is when two students or an adult and a student read the story in sequence (Carbo, 1990). Finally, the neurological impress method (NIM) (Heckelman, 1969) involves the teacher and a student reading together; in this practice, students learn to read fluently by modelling and imitating. Strategies used in the current research to eliminate reading difficulties are briefly explained below:

### **Repeated Reading**

Repeated reading is an effective method in improving the reading skills of students with reading difficulties. In this method, misread words are noted during reading. Then, the misread words are written on a card and practice is repeated until the student reads the words they misread accurately (Rosenberg, 1986).

In plain words, one of the most effective ways to increase the reading fluency of students with reading difficulties is repeated reading. When using the repeated reading strategy, reading texts should take students to the independent level. Students should initially be able to read at least 95% of the words accurately. They should then be expected to read repeatedly until they reach 100% accuracy level in a teaching environment organized either by a teacher or peer (Bender & Larkin, 2003).

### **Recorded Book Reading**

In recorded book reading, or Carbo reading method, students first listen to a recorded book read by a fluent reader, and then they read what they have heard. In first reading, the students should follow the words and read each word as they hear it. Following this, the students should listen to the recording a few times and at the same time read the text (Bender & Larkin, 2003). The students should be given recorded or CD books and other reading materials, and allowed to listen on their own while reading a printed version of the text. After a while, they will become independent readers even without a listening activity.

### **Word Box Strategy**

The word box strategy, another method to be used in eradicating reading difficulty, is an effective method for students to gain sound awareness. The word box helps children with reading difficulties recognize and spell words (Joseph, 2002; Keesey et al., 2015).

### **Story Mapping**

The story mapping method facilitates children's access to the important information in the text. The story map is quite effective in distinguishing important from unimportant information, creating interest in the text, forming and answering questions, visualizing information and understanding the text better (Akyol, 2014).

In recent years, there has been an increased need to design educational environments and materials based on individual differences. For this reason, it is important to determine the learning preferences of individuals. Rita Dunn (1992) argues that learning becomes permanent and effective when educational environments are organized according to individual learning styles to support personal learning processes. Maria Carbo (1980) built her concept of reading styles upon the learning styles developed by Dunn (1992). She observed that when individuals' reading styles are determined and learning environments are organized accordingly, success in reading increases. Previous research has shown that reading environments based on learning styles bring better results in fluent reading and reading comprehension, and help eliminate reading difficulties (Carbo, 1996; Carbo, 2003; Özdemir, 2013).

As the lacks and needs of students with reading difficulties vary, the intervention programs to be used should also be designed differently (Carbo, 1990). The programs should be created according to the learning styles of individuals (Haris & Sipay, 1990). It has been found that students are more successful in reading when their reading and learning styles match (Carbo, 1997). When learning processes are created according to individual reading styles, students with reading difficulties can learn to read well (Carbo, 2003).

Therefore, this study investigates the effects of activities based on individual learning preferences of a 4th grade student with reading difficulty on the development of reading and reading comprehension skills.

What are the effects of attempting to eliminate the reading difficulty of a 4th grader and to improve her reading skills by using learning styles on her:

- a) word recognition level?
- b) mistakes in oral reading?
- c) oral reading speed?
- d) reading comprehension level?

## **METHOD**

This study was planned as action research, which is a qualitative research design. Kurt Lewin, the pioneer of action research, associates the idea of such research with the idea of doing experiments in the field rather than in a laboratory. He demands that an action research experiment not only express theory, but also the results of the theory in such a way that they can be fed directly back into the theory (Lewin et al., 1939; cited in Reason & Bradbury, 2001). Action research is the process of working in a real or created environment to understand the quality of education and instruction and, where necessary, intervene and improve it (McTaggart, 1997).

This approach in education means that primary school teachers must become research methods to discover, interpret and describe the realities of the classroom (Foshay, 1998). It is a systematic way for teachers to review their own practice. Action research is about checking if practices are as good as you wish them to be, identifying any area that needs to improve, and finding ways of improvement (McNiff, 2016)

Action research aims to improve an existing situation under the leadership of an expert (Karasar, 2015). For this reason, the present study chose to use action research to overcome the reading difficulty of a 4th grader.

### **Study Group**

In order to create the study sample, a student suitable for the purpose of the study was selected by using the critical situation sampling method. In critical situation sampling, the researcher undertakes an in-depth examination of an issue that emerges as a problem (Ekiz, 2009). Prior to the study, the selected student was taken to a family physician to be screened for vision and hearing problems. No issue was detected in the examination. Afterwards, mental problems were also screened. As a result of examinations and tests, it was ascertained with a medical report that the student was not suffering from any health problems.

The student was chosen by the researcher, who is also a teacher, by observing factors such as having difficulty in reading and making more mistakes than her peers in her class. The reading skills of this student were tried to be developed by using the strategies known as the "Word Repetition Technique", "Echo Reading" and "Word Box" in the 2015-2016 school year. The student who was in the 3rd grade at the time of the study seemed to be at 2nd grade level. Her reading comprehension and word recognition skills improved (Özdemir & Gül, 2016).

The study group consisted of a female student attending grade 4 at an Elementary School during a semester who was not undergoing mainstreaming education. When the student was mentioned, her name was coded as (G.A.) for ethical reasons.

Information about the child was collected from her family which was conducted with G.A., a female student attending grade 4 was born on 16.07.2007 in a province of the western Black Sea region and is living in a village with her family. Her mother was using a hearing aid device and was a housewife. Her father was earning minimum wage. Both parents were elementary school graduates. They were living in a small house. G.A. had no study room of her own. Due to her hearing problem, the mother was not taking enough care of G.A. As the father had difficulty reading, she was not receiving enough feedback from her father either. The family was informed by the researcher about their child's conditions. G.A.'s teacher from Grade 1 mentioned in the interviews that she "*had difficulty reading, and could not learn to read*". This problem that she was experiencing with reading affected her other classes as well. She had therefore developed a negative attitude towards the school.

### **Data Collection Tools**

Data were collected by using the Marmara Learning Styles Scale designed by Şimşek (2007), the "Error Analysis Inventory" adapted to Turkish by Akyol (2014) from Harris and Sipay (1990), Ekwall and Shanker (1988) and May (1986), audio recordings, and texts included in Turkish textbooks for Grades 1, 2, 3 and 4 approved by the Board of Education. The permissions for the use of these scales were taken via e-mail.

Şimşek's (2007) "Marmara Learning Styles Scale" was used in the study. The Scale aims to identify the learning preferences of 3rd, 4th, and 5th graders aged 9-11. The content validity of the scale was .83, reliability coefficient was .6650, and Cronbach Alpha value was .6630. It therefore had an acceptable level of validity and reliability (Şimşek, 2007, p. 128).

The “Error Analysis Inventory” adapted to Turkish by Akyol (2014) from Harris and Sipay (1990), Ekwall and Shanker (1988) and May (1986) was also used in the data collection process. With this inventory that is used to evaluate reading and reading comprehension performance, the reader’s oral reading mistake types and reading comprehension level can be identified. Thanks to this tool, individuals’ reading levels can be identified.

**Independent Level:** Refers to the reader being able to read and comprehend material at an appropriate level without any help.

**Instructional Level:** Refers to the reader being able to read and comprehend material by taking support.

**Frustrating Level:** Refers to the level where the reader makes too many reading mistakes in the material and has difficulty comprehending (Akyol, 2014).

The student’s word recognition and comprehension level was determined with this inventory.

### **Implementation and Procedures**

Data were collected at an Elementary School where the researcher was working as a teacher during the semester task. The researcher noticed that a 4th grader was making too many mistakes while reading. The student was asked to read a material at her grade level aloud and a voice recording was completed. According to the Error Analysis Inventory, the student was at the frustrating level in her own grade level. After informing her family about the research, the required written consent was obtained and the study was initiated.

The implementation started in March and ended in June of the same year. The process in at Elementary School lasted 49 hours over 13 weeks. Texts from Turkish textbooks for Grades 1, 2, 3 and 4 approved by the Board of Education were used. A total of 41 texts, 20 of which were informative and 21 of which were narrative texts, were used. With the Marmara Learning Styles Scale, the dominant learning style of the student was found to be tactile learning. The word box strategy was used as it was shown by previous research to be effective in improving phonological awareness skills, word recognition skills with word repetition technique, and prosody reading skills with echo reading strategy. In line with the student’s tactile learning style, the word box strategy and the sandpit activity were used.

The student’s reading level was identified by using the “Error Analysis Inventory” adapted to Turkish by Akyol (2014) from Harris and Sipay (1990), Ekwall and Shanker (1988) and May (1986). This tool measures word recognition and reading comprehension skills. After identifying the student’s reading level, the “Marmara Learning Styles Scale” developed by Şimşek (2007) was used to find her dominant learning style. Following improvements in reading at the word recognition level, reading comprehension practice was done. Story mapping was used to develop reading comprehension skills. The story mapping method facilitates distinguishing important from unimportant information (Akyol, 2014), making a visual schema, and thus enables information to become more easily recorded in memory (Boulineau et al., 2004).

The 4th grader’s word recognition and reading comprehension levels were determined, starting from her own grade level. For this purpose, texts were selected from the Turkish textbooks (grades 1, 2, 3 and 4) according to the level of the student, and level identification studies were completed. A pilot task of 8 hours was carried out with methods used in the literature to overcome reading difficulties (word repetition technique, word box strategy). After this, the methods to be used were determined. It was decided that the main study would involve the "Carbo recorded book method", "word repetition technique", "dictation practice", "word box strategy", "sandpit activity" and "story mapping". The actual implementation process was completed with 41 texts in total.



Stages followed to eliminate reading difficulty were as follows:

- One copy of the texts to be studied was given to the student and another copy to the researcher.
- After this process, visual reading was undertaken by examining the visual of the text in order to activate the student's preliminary knowledge. Her ideas were asked about what the text was saying.
- Before starting to study the text, the texts read by the researcher were recorded digitally at the level of the student. Expert opinions were taken about whether the audio recordings created in this way were appropriate. After ensuring that the experts thought they were "appropriate", the digitally recorded texts were played to the student via headphones before she read the text. During listening, she was asked to follow the text.
- Then, the student was asked to read the text aloud.
- The researcher underlined misread words during reading.
- Prior to each implementation, basic and in-depth comprehension questions were prepared for each text by the researcher, and expert opinion was taken. Once the experts announced the questions "appropriate", the student's post-reading reading comprehension level was identified.
- After this stage, the misread words were written with colored crayons on white paper. Each syllable was written in a different color. In line with the word repetition technique, the practice was repeated until the student read previously misread words accurately.
- Then, the word box strategy was used, where the words that the students misread were said by the researcher and the student was asked to form the words accurately (using domino style tiles with letters on one side).
- Mistakes in reading were pinpointed and communicated to the student by the researcher. The student was asked to write these on a white board. After this stage, the student was asked to read every word that became written aloud.
- Sentences containing the words most commonly misread by the student were determined by the researcher. Following this, the researcher read each of those sentences with emphasis, intonation and appropriate expression. Immediately after, the student was asked to read the same sentence. In this way, the teacher modeled prosody for the student.
- For motivation, the student was given positive reinforcement. When she showed signs of tiredness or reluctance, the work was interrupted. After the student regained motivation, the practice continued.
- During the implementation, proper ventilation was ensured in the environment. The benefits of drinking water were mentioned and the daily water intake of the student was checked. Clean air and water are essential for the brain. They are effective in the correct and regular functioning of the brain. In addition, the student was also encouraged to play games such as chase during break time as exercise accelerates blood circulation. Blood is the most essential nutrient for the brain. It transmits oxygen to the brain and ensures its functioning.
- The researcher explained to the student how story mapping is used and what benefits it has in practice involving narrative texts.

- After these stages were completed, the student was asked to read the same text aloud. Mistakes during reading were noted by the researcher. The results obtained were transferred to the "Error Analysis Inventory" and word recognition and reading comprehension levels were determined.
- Each practice continued until grade 4, which was the student's own grade level, and until the "independent level" in word recognition and reading comprehension.
- As the process of course repetitions at home is crucial for the development of the student after the practices which were carried out at school by teachers, the family was notified and it was ensured that similar practices were encouraged in the home environment by the family.

## FINDINGS

The initial findings of the study came from the 8-hour pilot trial. Extending over a period of two weeks, this trial examined G.A.'s reading performance with the "word repetition technique", "dictation work", "word game" and "sand pit".

**Table 1.** Reading Comprehension Performance in Pilot Tasks

	Word Recognition Level	Oral Reading Mistake	Oral Reading Speed (in 1 min)	Reading Comprehension Level
Pilot 1	%80	7	53	%70
Pilot 8	%85	10	37	%100

Table 1 shows that the increase in G.A.'s word recognition level also improved her reading comprehension. It was observed that reading comprehension studies using story maps increased G.A.'s reading comprehension level.

During the main study, the texts were recorded digitally and played to the student via headphones. Then, the effects of the word repetition technique, dictation, word box strategy, sand pit and story mapping on G.A.'s reading and reading comprehension levels were examined. This lasted 41 hours in total, 4 hours weekly.

**Table 2.** Reading Comprehension Performance in the Main Study

	Word Recognition Level	Oral Reading Mistake	Oral Reading Speed (in 1 min)	Reading Comprehension Level
Main 1	%75	58	20	%50
Main 41	%95	11	38	%100

As can be seen in Table 2, as a result of 41 hours of practice, the student's level of word recognition and reading comprehension in the 4th grade text increased from frustrating (75%) to independent level (95%), and the oral reading speed per minute increased from 20 to 38 words. As the student's phonological awareness skills improved, it was observed that oral reading mistakes decreased from 58 to 11 words.

## RESULTS, DISCUSSION AND RECOMMENDATIONS

G.A., a 4th grade student who had difficulty in reading, was able to read a text of 274 words at her own grade level in 13 minutes and 22 seconds before the study. While reading the text, she misread 58 words in total. Her word recognition and reading comprehension levels were at the frustrating level. By the end of 49 hours of practice including the pilot trials, she became able to read the same text in 7 minutes and 23 seconds. During reading, he misread 11 words. Her word recognition and reading comprehension levels increased to the independent level. The word repetition technique, word box strategy, dictation and sandpit exercises were effective in improving the word recognition level of this student with reading difficulties. Improvements in word recognition level contributed in turn to the improvement of the student's reading comprehension skills. In addition, thanks to the story mapping method used to develop comprehension skills, her reading comprehension level increased from the level of frustration to independent.

The common basic problem for students with reading difficulties is an inability to match the letter they see with the sound they hear, rather than comprehension (Koçer, 2012). Individuals who cannot develop letter-sound matching skills cannot read fluently. In a study with 30 1st grade students aged 78-90 months, Küçükünal and İlkir (2019) emphasized that sound awareness is effective in improving literacy skills in children with reading difficulties. In addition, it was found that babies who exhibit delayed speaking and have difficulties in comprehending speech sounds experience reading difficulties at elementary school. For this reason, it is crucial to detect students with reading difficulties at an early age.

A predominantly tactile student according to the Marmara Learning Styles Scale, G.A. was involved with the "word box strategy" and "sand pit activity". Successful results have been obtained in eliminating reading difficulties. Research also shows that activities based on learning styles help eliminate reading difficulties (Barber et al., 1998; Carbo, 1978; Carbo, 1984; Carbo et al., 1986; Carbo, 1987; Carbo, 1990; Carbo, 1992; Carbo, 1995; Carbo, 1998; Carbo, 2008; Carbo, 2013; Duhaney & Ewing, 1998; Hodgins & Wooliscroft, 1997; Oglesby & Suter, 1995; Sondra & O'Tuel, 1989; Synder, 1994).

With the word repetition technique and word box strategy used to overcome G.A.'s reading difficulties, her level of word recognition increased from "frustrating to independent level". The effectiveness of the word repetition technique and the word box strategy in eliminating reading difficulties is also supported by previous research (Aktepe & Akyol, 2015; Akyol & Kodan, 2016; Akyol & Sever, 2019; Ateş, 2013; Dünder & Akyol, 2014; Ekiz et al., 2012; Fidan & Akyol, 2011; Özdemir, 2013; Özkara, 2010; Sezgin & Akyol, 2015; Ulu & Akyol, 2016; Uysal & Akyol, 2019; Uzunkol, 2013; Yamaç, 2015; Yıldırım et al., 2015; Yılmaz, 2008; Yılmaz & Köksal, 2008). In his research, Akar (2017) recorded and used texts in digital media, and observed that the word recognition skills of students with reading difficulty improved. Similar results were found in the present study.

Reading comprehension skill is one of the most basic elements of reading (Cain, 2010; Stavonich, 1986; Yılmaz & Köksal, 2008). One of the methods used to develop reading comprehension skills is story mapping. In a study conducted with individuals with learning disabilities, it was concluded that using a story map is effective in improving reading comprehension skills (Boulineau et al., 2004). Previous research has shown that the story mapping method is effective in improving the reading comprehension skills of individuals with reading difficulties (Boulineau et al., 2004; Duman, 2006; Duman & Tekinarslan, 2007; Idol & Croll, 1987; Işıkdogan & Kargin, 2010; Yılmaz, 2008).

In order for teachers to be successful in eliminating reading difficulties, the support of schools, families, psychologists and reading specialists is needed. There is no reading specialist team in Turkey yet. It is necessary to train reading specialists, primarily from primary school teachers, by providing the legal infrastructure as soon as possible and support it with postgraduate education. Reading specialists can support the teaching of reading skills, elimination of reading difficulties, organization

of educational environments, and use of effective methods and techniques (Akyol & Yıldız, 2013; Uyar et al., 2011).

### **Limitations of the Study and Recommendations for Future Research**

This research is limited to a 4th grader with reading difficulty, during a semester tactile activities prepared by the researcher according to the student's predominant learning preference, and texts in Turkish textbooks.

Longitudinal studies may be conducted in the future to address reading difficulty. Also, intervention into reading difficulty may also be studied at different stages of education in addition to elementary school.

**Conflicts of Interest:** The authors have declared no potential conflict of interest with respect to the research, authorship and publication of this article.

**Funding Details:** The authors did not receive any funding or financial support for the research, authorship, and/or publication of this article.

**CRedit Author Statement:** Metin Gül; Conceptualization, Data Collection, Data Analysis, Writing – Review & Editing. Olcay Özdemir; Conceptualization, Methodology, Resources, Investigation, Writing – Review & Editing.

**Ethical Statement:** The research was designed with the action research method and “critical situation sampling” method was employed as the sampling method. The student with no diagnosed mental, auditory or visual insufficiency, but has many mistakes during oral reading and reading comprehension and perform at a lower than her peers in the exams participated in the study. For ethical reasons, the name of the student's school was kept confidential and the student was named by giving a code. A wet-signed permission document was obtained from the family of the student participating in the study, stating that she participated completely voluntarily. Also the permissions for the data collection tools used in the research were taken via e-mail.

### **REFERENCES**

- Alexander, A. W., Andersen, H. G., Heilman, P. C., Voeller, K. K., & Torgesen, J. K. (1991). Phonological awareness training and remediation of analytic decoding deficits in a group of severe dyslexics. *Annals of Dyslexia*, 41(1), 193-206.
- Akar, C. (2017). Determining the effectiveness of audio-recording method in the treatment of reading disability. *Reading Improvement*, 57(2), 45-55.
- Aktepe, V., & Akyol H. (2015). Okuma güçlüğü ve giderilmesi: tek örneklemlili bir durum çalışması. *International Journal of Eurasia Social Sciences*, 6(19), 111-126.
- Akyol, H., & Yıldız, M. (2013). Okuma uzmanlığı ve okuma uzmanı yetiştirilmesine yönelik bir program önerisi/A program proposal for training the reading specialist. *Okuma Yazma Eğitimi Araştırmaları*, 1(1), 1-8.
- Akyol, H. (2014). *Türkçe öğretim yöntemleri*. Ankara: Pegem Akademi.
- Akyol, H. (2015). *Türkçe ilkokuma yazma öğretimi*. Ankara: Pegem Akademi.
- Akyol, H., & Kodan H. (2016). Okuma güçlüğü olan bir öğrencinin okuma güçlüğüne giderilmesine yönelik bir uygulama: akıcı okuma stratejilerinin kullanımı. *Ondokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi*, 35(2), 7-21.

- Akyol, H. ve Sever E. (2019). Okuma yazma güçlüğü ve bir eylem araştırması: ikinci sınıf örneği. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 34(3), 685-707.
- Amerikan Psikiyatri Birliği (1994). *Mental bozuklukların tanısı ve istatistiksel el kitabı, (DSM-IV: Diagnostic and statistical manual of mental disorders)* 4. Baskı. (E. Köroğlu, Çev.). Ankara: Hekimler Yayın Birliği.
- Ateş, S. (2013). The effect of repeated reading exercises with performance-based feedback on fluent reading skills. *Reading Improvement*, 50(4), 158-165.
- Bender, W. N., & Larkin, M. J. (2009). *Reading strategies for elementary students with learning difficulties: Strategies for RTI*. California: Corwin Press.
- Bender W.N. (2012). *Öğrenme güçlüğü olan bireyler ve eğitimleri*, (H. Sarı, Çev.). Ankara: Nobel Yayınları.
- Boulineau, T., Fore III, C., Hagan-Burke, S., & Burke, M.D. (2004). Use of story mapping to increase the story-grammar text comprehension of elementary students with learning disabilities. *Learning Disability Quarterly*, 27(2), 105-121. doi: 10.2307/1593645
- Breznitz, Z. (2006). *Fluency in reading: synchronization of processes*. New York: Routledge.
- Cain, K. (2010). *Reading development and difficulties*. West Sussex: Blackwell.
- Carbo, M. (1978). Teaching reading with talking books. *The Reading Teacher*, 32(3), 267-273.
- Carbo, M. (1980). Reading style: diagnosis, evaluation, prescription. *Academic Therapy*, 16(1), 45-52.
- Carbo, M. (1984). Recorded books= remarkable reading gains: how to help kids break through the reading barrier. *Early Years PreK/8*, 15(3), 44-47.
- Carbo, M., Rita, D., & Kenneth, D. (1986). *Teaching students to read through their individual learning styles*. Prentice-Hall Englewood Cliffs.
- Carbo, M. (1987). Deprogramming reading failure: giving unequal learners an equal chance. *Phi Delta Kappan*, 69(3), 197-201.
- Carbo, M. (1990). Igniting the literacy revolution through reading styles. *Educational Leadership*, 48(2), 26-29.
- Carbo, M. (1992). Eliminating the need for dumbed-down textbooks. *Educational Horizons*, 70(4), 189-193.
- Carbo, M. (1995). Continuum of modeling reading methods. *Teaching PreK-8*, 26(1), 85.
- Carbo, M. (1996). Reading styles: high gains for the bottom third. *Educational Leadership*, 53(5), 8-13.
- Carbo, M. (1997). Reading Styles Times Twenty. *Educational Leadership*, 54(6), 38-42.
- Carbo, M. (1998). The power of reading styles: accommodating students' strengths. *In perspectives on reading instruction*. Alexandria, VA: Association for Supervision and Curriculum Development, 23-26.
- Carbo, M. (2003). Achieving with Struggling Readers. *Principal*, 83 (2), 20-24.

- Carbo, M. (2008). Developing great teachers of reading—part 3, teach to natural learning strengths. *Instructional Leader (Texas Elementary Principals and Supervisors Association)*, 21(1), 6-11.
- Carbo, M. (2013). Series: powerful best reading practices for struggling readers — part 2, methods that teach reading the way the brain learns. *Instructional Leader Texas Elementary Principals and Supervisors Association*, 26(5), 1-3.
- Çayır, A., & Emine, B. (2017). Bireyselleştirilmiş okuma programının disleksi riski olan bir ilkokul öğrencisinin okuma becerileri üzerindeki etkisi. *Uluslararası Türkçe Edebiyat Kültür Eğitim Dergisi*, 6(1), 455-470.
- Chall, J. S. (1996). *Stages of reading development* (2nd ed.). London: Harcourt-Brace.
- Chall, J. S., Jacobs, V. A., & Baldwin, L. E. (1990). *The reading crisis: Why poor children fall behind*. Cambridge: Harvard University Press.
- Clark, C. J., Khattab, A., & Carr, E. C. J. (2015). Are Developmental Coordination Disorder (DCD)/Dyspraxia and/or Joint Hypermobility Syndrome inherent determinants of physical inactivity. *Physiotherapy*, 101, e254. DOI: 10.1016/j.physio.2015.03.436
- Dehaene, S. (2014). *Beyin Nasıl Okur*, (Ç. Karakuş, Çev.). İstanbul: Alfa Bilim.
- Duhaney, G. L. M., & Norma, E. J. (1998). An investigation of the reading styles of urban jamaican middle grade students with learning disabilities. *Reading Improvement*, 35(3), 114-19.
- Duman, N. (2006). *Hikâye haritası yönteminin eğitilebilir zihinsel engelli öğrencilerin okuduğunu anlama becerileri üzerinde etkisi*. (Yüksek lisans tezi). <https://tez.yok.gov.tr> sayfasından erişilmiştir.
- Duman, N. ve Tekinarslan, İ. Ç. (2007). Hikâye haritası yönteminin eğitilebilir zihinsel engelli öğrencilerin okuduğunu anlama becerileri üzerinde etkisi. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi*, 8(1), 33-55. doi: 10.1501/Ozlegt\_0000000104
- Dunn, R. (1990). Rita dunn answers questions on learning styles. *Educational Leadership*, 48(2), 15-19.
- Dunn, R., & Kenneth, D. (1992). *Teaching elementary students through their individual learning styles: practical approach for grades 3-6*. Boston: Allyn and Bacon.
- Dunn, R., & Kenneth, D. (1993). *Teaching secondary students through their individual learning styles: practical approaches for grades 7-12*. Boston: Allyn and Bacon.
- Dündar, H., & Akyol, H. (2014). Okuma ve anlama problemlerinin tespiti ve giderilmesine ilişkin örnek olay çalışması. *Eğitim ve Bilim*, 39(171), 361-377.
- Edward, A. P., Serna, L., James R. P. ve Jeneive, W. B. (2014). *Özel gereksinimli olan öğrenciler için öğretim stratejileri 10. Basımdan Çeviri* (Y. Özkan, Çev.). Ankara: Nobel.
- Ekiz, D. (2009). *Bilimsel araştırma yöntemleri*. Ankara: Anı Yayıncılık.
- Ekiz, D., Erdoğan, T., & Uzuner, F. G. (2012). Okuma güçlüğü olan bir öğrencinin okuma becerisinin geliştirilmesine yönelik bir aksiyon araştırması. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi*, 11(2), 111-131.

- Ekwall, E. E., & James, L. S. (1988). *Diagnosis and remedation of the disabled reader*. Third Edition. Boston: Allyn and Bacon Inc.
- Eroğlu, G. (2020). *Improving reading abilities in dyslexia with neurofeedback and multi-sensory learning*. (Doktora tezi). <https://tez.yok.gov.tr> sayfasından erişilmiştir.
- Fidan, K., N., & Akyol, H. (2011). Hafif düzeyde zihinsel öğrenme güçlüğü olan bir öğrencinin okuma ve anlama becerilerini geliştirmeye yönelik bir nitel çalışma. *Kuramsal Eğitimbilim*, 4(2), 16-29.
- Foshay, A. W. (1998). Action research in the nineties. *In The Educational Forum*, 62(2), 108-112. doi: 10.1080/00131729808983796
- Güven, M. (2004). *Öğrenme stilleri ile öğrenme stratejileri arasındaki ilişki*. (Doktora Tezi). <https://tez.yok.gov.tr> sayfasından erişilmiştir.
- Habib, M. (2000). The neurological basis of developmental dyslexia: an overview and working hypothesis. *Brain*, 123(12), 2373-2399. doi: 10.1093/brain/123.12.2373
- Harris, J. A., & Sipay, E. R. (1990). *How to increase reading ability*. New York: Longman.
- Heckelman, R. G. (1969). A neurological-impress method of remedial-reading instruction. *Academic Therapy*, 4(4), 277-282.
- Hinshelwood, J. (1917). *Congenital word-blindness*. Erişim adresi: [https://ia800708.us.archive.org/view\\_archive.php?archive=/22/items/crossref-pre-1909-scholarly-works/10.1016%252Fs0140-6736%252801%252999495-4.zip&file=10.1016%252Fs0140-6736%252801%252999645-x.pdf](https://ia800708.us.archive.org/view_archive.php?archive=/22/items/crossref-pre-1909-scholarly-works/10.1016%252Fs0140-6736%252801%252999495-4.zip&file=10.1016%252Fs0140-6736%252801%252999645-x.pdf)
- Hodgin, J., & Caaren, W. (1997). Eric learns to read: learning styles at work. *Educational Leadership*, 54(6), 43-45.
- Høien, T., & Sundberg, P. (2000). *Dyslexia: From theory to intervention* (Vol. 18). Dordrecht: Springer Science & Business Media.
- Idol, L., & Valerie J. C. (1987). Story-mapping training as a means of improving reading comprehension. *Learning Disability Quarterly*, 10(3), 214-229. doi: 10.2307/1510494
- Işıkdoğan, N., & Kargın, T. (2010). Investigation of the effectiveness of the story-map method on reading comprehension skills among students with mental retardation. *Educational Sciences: Theory and Practice*, 10(3), 1509-1527.
- Jenkins, J., & Katty, L. (1979). Evaluation of error-correction procedures for oral reading. *Journal of Special Education*, 13(2), 145-156. doi: 10.1177/002246697901300206
- Joseph, L. M. (2002). Helping children link sound to print: phonics procedures for small-group or whole-class settings. *Intervention in School and Clinic*, 37, 217-221. doi: 10.1177/105345120203700404
- Karasar, N. (2015). *Bilimsel Araştırma Yöntemi*. Nobel: Ankara.
- Keesey, S., Konrad, M., & Joseph, L. M. (2015). Word boxes improve phonemic awareness, letter-sound correspondences, and spelling skills of at-risk kindergartners. *Remedial and Special Education*, 36(3), 167-180. doi: 10.1177/0741932514543927

- Kirk, S. A., & Bateman, B. (1962). Diagnosis and remediation of learning disabilities. *Exceptional Children*, 29(2), 73-78. doi: 10.1177/001440296202900204
- Kochnowar, J., Richardson, E., & DiBenedetto, B. (1983). A comparison of the phonic decoding ability of normal and learning-disabled children. *Journal of Learning Disabilities*, 16(6), 348-351. doi: 10.1177/002221948301600609
- Koçer, D. (2012). Okuma bozukluğu. Erişim adresi: [https:// beyazokul.com/okuma-bozuklugu](https://beyazokul.com/okuma-bozuklugu)
- Kuhn, M. R., & Stahl, S. A. (2003). Fluency: A review of developmental and remedial practices. *Journal of educational psychology*, 95(1), 3.
- Kuruyer, G. H., & Özdemir, O. (2019). Okuma ve yazma güçlüklerinin tanılanması ve giderilmesi. H. Akyol ve A. Şahin (Eds), *Türkçe öğretimi öğretmen adayları ve öğretmenler için içinde* (s. 243-260). Pegem Akademi.
- Kussmaul, A. (1877). Disturbance of speech. *Cyclopedia of the practice of medicine*, 581-875.
- Küçükünal, I. S. ve Öğretim, A.D. (2019). 78-90 ay aralığında okuma yazma güçlüğü olan çocuklarda konuşma sesleri bozukluğunun incelenmesi. *International Journal of Human Sciences*, 16(3). doi: 10.14687/jhs.v16i3.5687
- May, B. F. (1986). *Reading as communication: an interactive approach*. 2nd Edition. Indiana: Merrill Publishing Company.
- McTaggart, R. (1997). Reading the collection. *Participatory action research*. State University of New York.
- McNiff, J. (2016). *You and your action research project*. New York: Routledge.
- Merrett, F. (1998). Helping readers who have fallen behind. *Support for learning*, 13(2), 59–64.
- Millî Eğitim Bakanlığı (MEB). (2016). İlkokul Türkçe 1 öğrenci çalışma kitabı. Ankara: MEB Yayınları.
- Millî Eğitim Bakanlığı (MEB). (2016). İlkokul Türkçe 2 öğrenci çalışma kitabı. Ankara: MEB Yayınları.
- Millî Eğitim Bakanlığı (MEB). (2016). İlkokul Türkçe 3 öğrenci çalışma kitabı. Ankara: MEB Yayınları.
- Millî Eğitim Bakanlığı (MEB). (2016). İlkokul Türkçe 4 öğrenci çalışma kitabı. Ankara: MEB Yayınları.
- Millî Eğitim Bakanlığı İlköğretim Türkçe Dersi (1, 2, 3, 4, 5, 6, 7 ve 8. Sınıflar) Öğretim Programı (2020). Erişim Adresi: <http://mufredat.meb.gov.tr/Dosyalar/20195716392253-02-T%C3%BCrk%C3%A7e%20%C3%96%C4%9Fretim%20Program%C4%B1%202019.pdf>
- Morgan, W. P. (1896). A case of congenital word blindness. *British medical journal*, 2(1871), 1378. doi: 10.1136/bmj.2.1871.1378
- National Reading Panel (2000). Report of the development of vocabulary knowledge and reading comprehension through contextually based multiple meaning vocabulary instruction. *Education and Treatment of Children*, 30, 1-22.



- Oglesby, F., & Suter, W. N. (1995). Matching reading styles and reading instruction. *Research in the Schools*, 2(1), 11-15.
- Orton, S. T. (1925). Word-blindness in school children. *Archives of Neurology & Psychiatry*, 14(5), 581-615. doi: 10.1001/archneurpsyc.1925.02200170002001
- Özdemir, M., & Kaptan, F. (2017). Analyzing the learning styles of pre-service primary school teachers. *Journal of Education and Practice*, 8(11), 11-19.
- Özdemir, O. (2013). *İlköğretim öğrencilerinin öğrenme stillerine göre okuma güçlüklerinin giderilmesi* (Doktora tezi). <https://tez.yok.gov.tr> sayfasından erişilmiştir.
- Özdemir, O., & Gül, M. (2016). *Kelime tekrar tekniği, eko okuma ve kelime kutusu stratejileri kullanılarak bir ilkokul öğrencisinin okuma güçlüğünün giderilmesi*. 15. Uluslararası Sınıf Öğretmenliği Eğitimi Sempozyumu'nda sunulan bildiri, Muğla Sıtkı Kocaman Üniversitesi, Muğla.
- Özkara, Y. (2010). Okuma güçlüğü olan öğrencilerin okuma düzeylerinin geliştirilmesine yönelik bir uygulama. *Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 5, 109-119.
- Rasinski, T. V. (2003). *The fluent reader: oral reading strategies for building word recognition, fluency, and comprehension*. New York: Scholastic Inc.
- Rasinski, T. V., & Hoffman, J. V. (2003). Oral reading in the school literacy curriculum. *Reading Research Quarterly*, 38(4), 510-522. doi: 10.1598/RRQ.38.4.5
- Reason, P., & Bradbury H., (Eds.) (2001). *Handbook of action research: participative inquiry and practice*. California: Sage.
- Reid, G., & Shannon, G. (2014). *Disleksi ile Başa Çıkmak İçin 100 + Pratik Öneri*; (Ç. Aras, Çev.). Ankara: Arkadaş Yayınevi.
- Richek, M. A. (2002). Reading problems: Assessment and teaching strategies. Allyn & Bacon.
- Rosenberg, M. S. (1986). Error-correction during oral reading: A comparison of three techniques. *Learning Disability Quarterly*, 9(3), 182-192. doi: 10.2307/1510463
- Sezgin, Z. Ç., & Akyol, H. (2015). Okuma güçlüğü olan dördüncü sınıf öğrencisinin okuma becerilerinin geliştirilmesi. *Türkçe Eğitim Araştırma Makalesi*, 4(2), 4-16.
- Snyder, A. E. (1994). On the road to reading recovery. *School Administrator*, 51(1), 23-24.
- Sondra, H. B., & O'Tuel, F. S. (1989). The effect of sustained silent reading and writing on achievement and attitudes of seventh and eighth grade students reading two years below grade level. *Reading Improvement*, 26(4), 290-297.
- Shaywitz, S. (2003). *Overcoming dyslexia*. New York: First Vintage Books Edition.
- Şimşek, Ö. (2007). *Marmara öğrenme stilleri ölçeğinin geliştirilmesi ve 9-11 yaş çocuklarının öğrenme stillerinin incelenmesi* (Doktora tezi). <https://tez.yok.gov.tr> sayfasından erişilmiştir.
- Torgesen, J. K. (2002). The prevention of reading difficulties. *Journal of School Psychology*, 40(1), 7-26. doi: 10.1016/S0022-4405(01)00092-9

- Ulu, H., & Akyol, H. (2016). The effects of repetitive reading and pqr strategy in the development of reading skill. *Eurasian Journal of Educational Research*, 63, 225- 242. doi: 10.14689/ejer.2016.63.13
- Uyar, Y., Yıldırım, K., & Ateş, S. (2011). Okuma uzmanlığının Türkiye’deki üniversitelerde lisansüstü bir program olarak yapılandırılması. *Uşak Üniversitesi Sosyal Bilimler Dergisi*, 4(1), 132-149.
- Uysal, P. K., & Akyol, H. (2019). Okuma güçlüğü ve giderilmesi: bir eylem araştırması. *Eğitim ve Bilim*, 44(198), 17-35. doi: 10.15390/EB.2019.8032
- Uzunkol, E. (2013). Akıcı okuma sürecinde karşılaşılan sorunların tespiti ve giderilmesine yönelik bir durum çalışması. *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, 9(1), 70-83.
- Yamaç, A. (2015). İlkokul dördüncü sınıf düzeyinde bir öğrencinin sesli okuma akıcılığını arttırmaya yönelik bir uygulama. *Kastamonu Eğitim Dergisi*, 23(2), 631-644.
- Yılmaz, M. (2008). Kelime tekrar tekniğinin akıcı okuma becerilerini geliştirmeye etkisi. *Türk Eğitim Bilimleri Dergisi*, 6(2), 323-350.
- Yılmaz, M., & Köksal, K. (2008). Tekrarlı okuma yönteminin okuduğunu anlamaya etkisi. *Milli Eğitim*, 179, 51-65.
- Yıldırım, K., Ritz, E., Akyol, H., & Rasinski, T. (2015). Assisting a struggling Turkish student with a repeated reading fluency intervention. *Reading Matrix: An International Online Journal*, 15(1), 252-261.
- Yiğiter, S. (2005). *Sınıf öğretmenlerinin özgül öğrenme güçlüğüne ilişkin bilgi düzeyleri ile özgül öğrenme güçlüğü olan çocukların kaynaştırılmasına yönelik tutumları arasındaki ilişkinin incelenmesi* (Yüksek lisans tezi). <https://tez.yok.gov.tr> sayfasından erişilmiştir.

## Caught Off Guard: Parenting Children with Disabilities During COVID-19 Pandemic\*

**Salih Rakap<sup>i</sup>**

University of North Carolina Greensboro - Ondokuz Mayıs University

**Meryem Vural Batık<sup>ii</sup>**

Ondokuz Mayıs University

**Mustafa Karnas<sup>iii</sup>**

Kilis Yedi Aralık University

**Sinan Kalkan<sup>iv</sup>**

Çanakkale Onsekiz Mart University

**Uygar Bayrakdar<sup>v</sup>**

Ondokuz Mayıs University

**Halil Ibrahim Sari<sup>vi</sup>**

Kilis Yedi Aralık University

### Abstract

Families of children with disabilities faced significant challenges during COVID-19 pandemic due to the social isolation and restrictions put in place to reduce or stop transmission of the virus. Using a qualitative approach, this study aimed to identify the challenges children with disabilities and their families have faced during COVID-19 pandemic as a result of changes in their daily routines; examine the strategies and resources families used to deal with these problems; and determine the supports they needed to address them. Data were collected from 40 parents of children with disabilities through semi-structured interviews and analyzed using inductive content analysis. Results of qualitative analysis showed that challenges encountered by families of children with disabilities included changes in daily routines and family priorities, increased problem behaviors exhibited by children, difficulties regarding virtual learning, and adverse impact in intra-family relationships. Consulting with teachers and other professionals, getting help from close family members or friends, using different education platforms, and bonding with family members were among the strategies and resources families used to address challenges they faced. Parents reported needs for psychological, economic, and education support for themselves and their children. COVID-19 pandemic significantly impacted lives of children with disabilities and their families in multiple ways. Findings of this study have potentials to guide the future efforts in providing support services to families of children with disabilities and allocating resources in similar situations.

**Keywords:** COVID-19 Pandemic, Children With Disabilities, Parents, Challenges, Resources, Supports, Needs

**DOI:** 10.29329/ijpe.2023.534.3

**Submitted:** 12/11/2022

**Accepted:** 20/03/2023

**Published:** 01/04/2023

-----  
\* Work described in this article was supported by Grant # 120K259 from The Scientific and Technological Research Council of Turkey (TUBITAK). The opinions expressed are those of the authors, not the funding agency.

<sup>i</sup> **Salih Rakap**, Assoc. Prof. Dr., Department of Specialized Education Services, University of North Carolina Greensboro ; Department of Special Education, Ondokuz Mayıs University, Samsun, Turkey, ORCID: 0000-0001-7853-3825

**Correspondence:** srakaptr@gmail.com

<sup>ii</sup> **Meryem Vural Batık**, Assoc. Prof. Dr., Department of Special Education, Ondokuz Mayıs University, Samsun, Turkey, ORCID: 0000-0002-7836-7289

iii **Mustafa Karnas**, Assist. Prof. Dr., Department of Special Education, Kilis 7 Aralik University, Kilis, Turkey, ORCID: 0000-0003-0304-1791

iv **Sinan Kalkan**, Assist. Prof. Dr., Department of Special Education, Canakkale Onsekiz Mart University, Canakkale, Turkey, ORCID: 0000-0001-6890-6421

v **Uygar Bayrakdar**, Lecturer, Department of Child Care and Youth Services, Ondokuz Mayıs University, Samsun, Turkey, ORCID: 0000-0001-6310-6492

vi **Halil Ibrahim Sari**, Assoc. Prof. Dr., Department of Educational Science, Kilis 7 Aralik University, Kilis, Turkey, ORCID: 0000-0002-7899-2797

## INTRODUCTION

The COVID-19 pandemic continues to impact societies around the world. Like many other countries, Turkey took precautionary measures such as curfew and social restrictions in order to prevent the spread of the virus. These restrictions resulted in changes in family's daily routines which have adversely impacted intra-family communication and relationships (Ahmen et al., 2020) and family's emotional well-being in many cases. International reports noted that families from disadvantaged backgrounds are among the most affected groups. In addition to changes in daily lives and routines, the pandemic significantly affected the way in which educational and developmental services are provided to children with disabilities (United Nations, 2020). Studies have reported that children with disabilities have shown more challenging behaviors during the pandemic and their social interaction behaviors have been adversely impacted (Narzisi, 2020). Moreover, daily routines of these children such as sleep, eating, and technology use are disrupted (Tso et al., 2020).

Access to therapy and special educational services and materials were restricted during the pandemic (Warner-Richter & Lloyd, 2020). Virtual educational opportunities and therapies provided to children with disabilities are insufficient, and most materials are not suitable for their individual characteristics and needs (Ayda et al., 2020). As a result, parents of children with disabilities had increasing levels of responsibilities to identify activities for supporting development, well-being and learning of their children and frequently experience anxiety about not knowing what to do in this process. Parents had difficulties to balance their increased responsibilities and feel overwhelmed (Garbe et al., 2020) as the boundaries between work and home are unset. The increased care burden, social isolation, and stress can cause the deterioration of relationships among family members including spousal and parent-child interactions (Prime et al., 2020).

The extant literature indicates that parents of children with disabilities use problem-based coping strategies which often includes seeking external support such as social, educational, and informational support, and emotion-based coping strategies that include what has been described as a desperate approach, submissive approach, and optimistic approach (Eren & Dogan, 2020). Despite the difficulties in caring of a child with disabilities, the use of appropriate coping strategies plays an important role in preventing or reducing the negative effects of challenges families face (Durukan et al., 2010). Although some families use coping strategies to address these challenges, many may need additional support to cope with the challenges they face during the pandemic. For example, studies have indicated that professional assistance by special education teachers is the most needed support by families (Toseeb et al., 2020). Therefore, exploring the type and intensity of supports that families need contributes to the determination of the support that will be offered primarily in cases of pandemics and similar circumstances that may occur in the future.

The present study used a qualitative approach to identify the challenges children with disabilities and their families have faced during the COVID-19 pandemic; to examine the strategies and resources families used to deal with these problems; and to determine the supports they needed to address them. The following research questions were addressed in the present study: (1) What challenges do families of children with disabilities experience during the COVID-19 pandemic? (2) What are the strategies and resources used by families of children with disabilities to deal with the

problems they face during the COVID-19 pandemic? (3) What supports do families of children with disabilities need to deal with the problems they face during the COVID-19 pandemic?

## METHOD

### Participants

Participants of this study included 40 parents of children with developmental disabilities. Parents were selected randomly from a list of parents who participated in a larger research project conducted to examine the impact of the COVID-19 pandemic on the quality of life of children with disabilities and their families in Turkey (Rakap, et al., 2022). Researchers contacted 91 randomly-selected parents (approximately 10% of the participants on the larger study) through phone and explained the purpose and rationale of the study with a goal of recruiting at least 30 participants for the current study. Research showed that samples of 20 to 30 participants are most common in qualitative research with 25-30 participants being a typical recommendation. From the 91 parents contacted, 40 agreed and 51 declined to participate in the current research. We reached data saturation after 32 interviews and completed 5 additional interviews to conclude data collection. Of the 37 parents who were interviewed, all (100%) were mothers with a mean age of 37.05 (SD = 6.15; range = 22 - 50). Participants had a total of 44 children with disabilities; 26 (59%) were female and 18 (41%) were male. The mean age of children was 8.67 (SD = 4.50; range = 3 - 18). Of these children, 14 (32%) had mild, 15 (34%) had moderate, and 15 (34%) had severe developmental disabilities, while 15 (34%) were in preschool, 14 (32%) in primary school, and 12 (27%) in secondary/high school ( $n_{\text{not reported}} = 3$ ; 7%). Children had a variety of different disabilities including autism spectrum disorder ( $n = 19$ ; 43%), intellectual disabilities ( $n = 10$ ; 23%), learning disabilities ( $n = 3$ ; 7%), hearing impairments ( $n = 3$ ; 7%), multiple disabilities ( $n = 3$ ; 7%), speech and language impairments ( $n = 2$ ; 5%), physical disabilities ( $n = 2$ ; 5%), and attention deficit and hyperactivity disorder ( $n = 2$ ; 5%). Demographic information about participating parents and their families is presented in Table 1.

**Table 1 Demographic Characteristics of Participants (N = 37)**

Variable	N	%
Parental Education		
Primary School	10	27
Middle School	5	14
High School	11	30
College	11	30
Socioeconomic Level		
Low	16	43
Middle	16	43
High	0	0
Not Reported	5	14
Marital Status		
Married/Together	36	97
Not Reported	1	3
Number of Children in Family		
1	15	37.5
2	16	40
3+	9	22.5
Number of Children with Disabilities		
1	36	90
2	4	10

## ***Procedures***

### **Data Collection Tools**

Researchers developed a Demographic Information Form and Semi-Structured Interview Form and Guide to collect data in this study. The Demographic Information Form was developed to collect demographic data about the parents, their children and other family members and it was completed by participating parent before the interview using a paper-pencil or an online form. The Semi-Structured Interview Form and Guide included 10 open-ended questions developed to determine the problems that the parents of children with disabilities faced during the pandemic, and the resources and strategies they used or need to deal with these problems. Initial version of the interview form and guide developed by the research team included 14 questions. This version was examined by three experts in the field of special education. Based on the feedback from the experts, three questions were combined with other questions; one question was deleted; and three questions were revised to facilitate the meaning. The revised version was piloted with two mothers of children with disabilities who did not participate in the actual study. Minor revisions were conducted on question wording for clarity after the pilot administrations. The final form was used in the present study to collect qualitative data.

### **Data Collection Procedures**

Semi-structured interviews were conducted using phone or online platforms. The format of each interview (i.e., phone or online) was determined based on the preference of participants. The video feature was kept off when online platforms were used for interviews. Four researchers trained by the first author conducted the interviews using the interview protocol developed by the research team between September 1-October 25, 2020. The interview protocol included an opening statement, brief chat with the participant to build rapport, a description of study purpose, questions and a closing statement. Each interviewer interviewed with 9-10 parents. Parents and researchers who conducted the interviews did not know each other prior to the interviews. Rapport was established with participating parents thought having small talks and casual conversations at the beginning of the interview about personal life and interests and noting the importance of parental experience and perspectives. Prior to asking the first interview question, the researcher briefly explained the purpose of the study and asked participating parents whether they had any questions about the study before commencing the interview. All interviews were conducted in the researchers' offices and recorded (audio recording) with written and verbal consent from the participants. Interviews lasted an average of 25.2 minutes (SD = 8.7; range = 12-60 minutes). Each participant was sent a copy of her/his interview transcript and asked to provide additional comment, corrections or clarifications. Ethical approval was obtained from the XXX University Social Science and Humanities Research Ethic Committee (Protocol Number: 2020/304) prior to research activities.

### **Data Analysis**

Data collected through semi-structured interviews were analyzed using inductive thematic analysis to determine how parents made sense of the COVID-19 outbreak and what they experienced during the pandemic (Creswell & Creswell, 2018). Thematic analysis is a method used to identify, analyze and report patterns (themes) in data. In this context, first, audio recordings of interviews were transcribed and all identifying information was removed from the text. Then, these data were analyzed according to the inductive thematic analysis approach. For this purpose, the data were read twice by two researchers in order to gain a general perspective and the first ideas were noted. Next, the data encoding stage was started. At this stage, the aim was to systematically encode the interesting features of the data and to gather the data related to each code. Following the coding process, themes were developed based on the codes. In the next stage, the themes were reviewed and a thematic map for the analysis was created. In the last stage, themes are defined and named. Concrete, striking, and convincing data were directly quoted (selection of samples), the encoded data contents were reviewed and reported for the last time. For reliability purpose second researcher listened to 10% of the audio recordings and compared them with the transcripts. In addition, the principles of credibility,

transferability, verifiability, and consistency were taken into account in order to support the validity and reliability of the qualitative analysis. While diversification and member checking were used for credibility of the research, detailed description and diversity in the selection of the sample were used for transferability. The research process, characteristics of the participants, data collection and analysis processes are detailed for verifiability. The coding was completed by two researchers and intercoder reliability was checked. The mean intercoder reliability was .98 (range = .89 – 1.00). NVivo 12 Pro was used for qualitative data analysis.

## RESULTS

Three main themes were identified as a result of qualitative analysis of data collected from participating parents through semi-structured interviews. These included impact of COVID-19 pandemic on (a) Family's Daily Life, (b) Children's Education, and (c) Intra-Family Relationships. Table 2 shows sub-themes under each of the three themes.

**Table 2 Theme and Sub-Themes Obtained as a Result of Qualitative Data Analysis**

Impact on Family's Daily Life	Impact on Children's Education	Impact on Intra-Family Relationships
Challenges during daily routines	Concerns about education	Relationships with children
Difficulties with children's behaviors	Different educational platforms used	Spousal relationships
Impact on family priorities	Family education and training	Sibling relationships
Types of supports needed		
Strategies and suggestions		

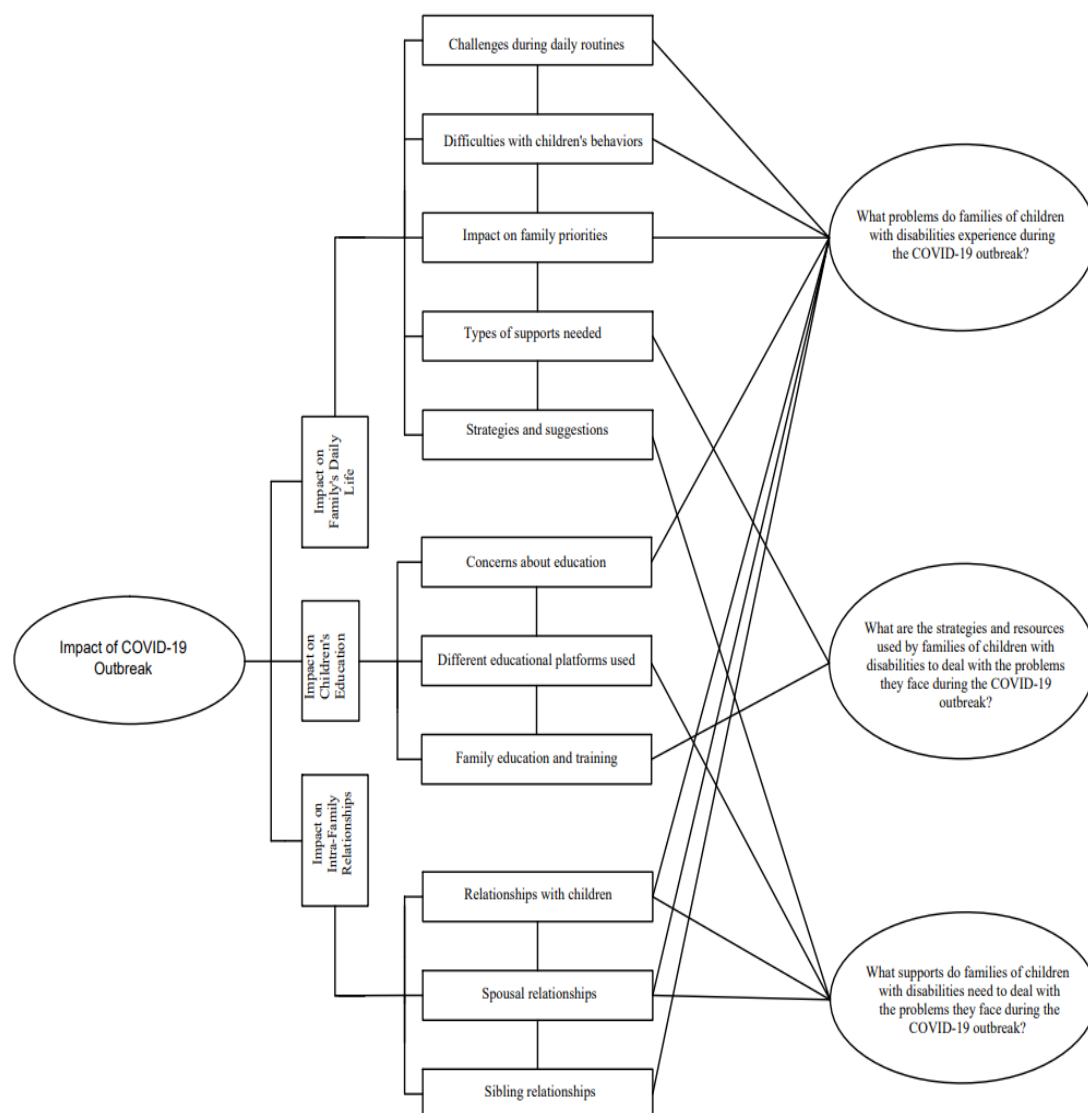
Next, as shown in Figure 1, the themes and sub-themes were examined and regrouped under the research questions and results were presented by research questions.

### Problems Families of Children with Disabilities Faced During Pandemic

As seen in Figure 1, seven sub-themes grouped under the three themes were used to answer the first research question: (a) challenges during daily routines, (b) difficulties with children's behaviors, (c) impact on family priorities, (d) difficulties and concerns about education, (e) relationships with children, (f) spousal relationships, and (g) sibling relationships.

#### *Challenges during Daily Routines*

Parents identified several challenges in relation to daily routines of their children and family. Child related challenges included not being able to go to school or a playground, not being able to socialize, disruption in sleep routine, increased screen time, decreased appetite, increased time spent at home, not maintaining self-eating skills, and demanding parents to feed. Family or parent related challenges included inability to meet the basic needs of the household due to financial difficulties, increase in the time required for the care of children, decrease in the time allocated for themselves, running out of games and activities with children, not being able to take children to routine doctor checks, constant hand washing, difficulty in going to places such as markets with children, reduced or no support for childcare, increased workload at home, not being able to use public transportation and losing jobs. Parents of children with autism and those with moderate to severe disabilities were impacted more from the changes in daily routines due to pandemic. One of the parents who participated in the interviews expressed the difficulties associated with daily routines as follows: *"It is a pretty bad process for me, psychologically. I'm just getting through now, but I'm still struggling, frankly. We cannot go out much with children during the pandemic, because they will touch everywhere and get sick... we prefer not to go out, but to stay at home."* Another parent said the following about the difficulties associated with daily routines: *"... In other words, our social activity is completely, dead... In the days of coronavirus, my child spends most of his time on the phone playing games because we can't get out much and we are out of games and activities at home. We can't take him to the backyard because there will be other kids there... He is very overwhelmed, we are overwhelmed."*



**Figure 1 Themes and Sub-Themes by Research Question**

### ***Difficulties with Children's Behaviors***

When the views under this sub-theme were examined, several difficulties were identified in relation to children's behaviors. These behavioral difficulties included obsessive and aggressive behaviors; using harmful behavior such as opposing and hitting; showing inappropriate behaviors to get attention; having tantrums; increased sleep duration; and decreased communicative, academic, and social skills. These challenging behaviors were reported more frequently by parents of children who had moderate to severe disabilities and parents of older children. One of the participants the difficulties related to children's behavior as follows: *"When the pandemic started, he become very aggressive. He was constantly yelling and calling. He wanted to go out, we couldn't. Then at some point government said that the children with disabilities can go out on the street with their reports. Then his father started taking him outside once in a while. It just got better... Thank God."* Another parent reported the following about the difficulties associated with their child's behaviors: *"But there is this. We noticed when we went out. My child was a very social child, you know, he can't socialize with others now because of the virus. Other children did not want to approach him. He didn't understand why they were far from him. His grandmother and grandfather stayed away... Then, he stopped approaching them, did not hug them, stayed away from his friends and showed a bit harsher attitude towards people. In that respect, of course, it had a huge impact. "*



### ***Impact on Family Priorities***

Parents reported that their priorities have changed significantly during the pandemic. Reported family priorities during the pandemic included protecting health of all family members (not getting the virus), providing education at home, cleaning, being economical and saving, increasing independent life skills of children and ensuring their happiness. Some parents also reported concerns about their children's care if something happens to them because of the virus. One of the parents who participated in the interviews expressed the impact of the pandemic on family priorities as follows: *"Cleaning. Our first priority is now cleaning. Prior to the virus, we would not clean what we bought from the market, we would not, now we clean them in front of the door, keep them there for a while, and then take them inside like that... Our cleaning has changed a lot in the first place."* Another parent reported that they were worried about their children and what will happen to them if they die from COVID-19: *"Many things have changed in our lives. There is fear, there is anxiety, so let's say we protected our child, if something happens to me, there is a fear who will take care of him ... "*

### ***Concerns about Education***

When the data under this sub-theme were examined, several difficulties and concerns related to education of children during the pandemic were identified. These included children not complying with the individualized education plan in the home environment, getting bored and decreased motivation and attention during one-on-one work time, wanting to play games with computers during virtual classes, declining in academic and social areas, content of virtual classes not being adequate for the individual needs of children, access issues to virtual classes due to lack of internet connection and computer, parental lack of knowledge in computer use to help their children in virtual classes, and difficulty in supporting academic skills and being in the role of a teacher. With the opening of schools during the pandemic, safety concerns in school environment (cleaning) were added to the list of concerns parents had. In addition, parents reported that they do not see themselves as competent in educating their children. These concerns were voiced more frequently by the parents of children with moderate to severe autism and intellectual disabilities and parents whose children were in primary school. One of the parents who participated in the interviews expressed the concerns and challenges regarding their children's education as follows: *"I don't want my child's education to be interrupted. I cannot give those trainings at home... I am not their teacher; they do not listen to me. I am their mother; I can't educate them like the teachers educate my children."* Another parent reported the following challenges about their child's education during COVID-19 pandemic: *"... Rehabilitation centers are like a blessing, but when we look at them from this point of view, but when we look at them during the pandemic, it is very difficult to decide taking my child there for therapies... into that crowded building... Even if I tell my child to wear a mask or follow the hygiene rules, you never know if they will follow your directions."*

### ***Relationships with Children***

The examination of findings under this sub-theme revealed prolonged amount of time spent at home with children during the pandemic and new parental roles (e.g., teaching or facilitating learning) adversely impacted parents and child relationships. Parents reported that managing their children's behaviors became more difficult as the time spent at home increased and they began showing increased negative parental behaviors such as scolding or reprimanding due to the increase in opposing behaviors in children. Moreover, participating parents noted that because the new role (supporting development and learning of their children at home) they assume increased their workload at home, their patience towards children decreased. One of the participants stated that she developed an obsession with cleaning during the pandemic and therefore could not touch her children out of fear of infecting them and this situation negatively affected their relationships. One of the participants expressed the effect of the pandemic in the relationships with her child as follows: *"... My relationships with my children... Of course, it was negatively affected, but being at home all the time has an overwhelming effect. Not knowing what will happen. There is a feeling of pessimism, a desire not to do anything."* Another parent reported the following to note the impact of pandemic on their

relationship: *"Well, E is tired of me; I am tired of E... so it has been such a difficult process. Somedays, it is very difficult to be at home with him by myself and I watch the door for my husband to come home... being at home with your child with disabilities all the time is very overwhelming."*

### ***Spousal Relationships***

Participating parents also noted negative impact of pandemic on their spousal relationships. These included increased levels of stress, problems, yelling, and arguments, decreased levels of tolerance and respect between spouses as the time together at home increased. One parent expressed the effect of the pandemic on his relationship with his wife as follows: *"I got more aggressive. Things I would typically tolerate; I can't tolerate them anymore, instead I shout or yell at her... I am not used to spend this much time at home. I really need to go back to work."* Another parent stated the following to note the impact of pandemic on her relationship with her husband: *"... On the one hand, you burden the emotional discomfort of a father who is locked in the house, on the other hand your emotional discomfort. These also cause conflicts periodically."*

### ***Sibling Relationships***

When the data under this sub-theme were examined, two main areas of concerns in relation to sibling relationships aroused. There was more conflict and arguments among siblings as they had to share the same space more frequently and increased levels of jealousy and compulsive behaviors towards each other were observed. One of the parents who participated in the interviews expressed the effect of pandemic on sibling relationships as follows: *"Between siblings ... because they see each other all the time and need to share thing at home more frequently, there can be discussions and disagreements with each other, unavoidably. ... If they could go out in the neighborhood, on the street or in the park and get rid of their stress, this problem will disappear."*

## **Strategies and Resources Families of Children with Disabilities Used**

As seen in Figure 1, five sub-themes grouped under the three themes were used to answer the second research question: (a) strategies and suggestions, (b) the use of different educational platforms used, (c) relationships with children, (f) spousal relationships, and (g) sibling relationships.

### ***Strategies and Suggestions***

Participating parents reported the use of several strategies to overcome the problems they face during the pandemic. These included consulting with different individuals including teachers about education-related issues, searching information via online platforms (i.e., search engines), seeking help from the other spouse, close family members or friends, getting psychological support from a professional, spending time alone, thinking worse off and be thankful, praying, showing patience, taking nutritional supplements in relation to COVID-19, and taking their children outside during off times to avoid the crowd. A parent expressed her ways of dealing with the difficulties encountered during the pandemic as follows: *"There are certain people I can ask what to do and how I can solve a problem... For example, my son's teacher. The current teacher, we are always in contact with her... I am talking to her; I get support from her about what I can do at home with my son. We use internet to find information or use the resources (books etc.) we already have at home."* Another parent noted the following strategy to deal with the challenges of the pandemic: *"At least I went to the psychiatrist to stay calm myself, I get psychological support, I am on medication right now, that way I can be more patient and take care of my family during this difficult time."*

The suggestions of the participants to better solve the problems they encounter included the controlled opening of schools, providing remote psychological support services to parents, financial assistance to families, increasing the frequency of parent education and training program delivered online, teaching parents how to use computers, designing virtual learning programs tailored towards individual needs of children with disabilities and shortening their duration, providing home-based

special education services through itinerant teachers, and ensuring that everyone complies with pandemic measures. One of the parents interviewed noted her suggestion to deal with the difficulties faced during the pandemic as follows: *"I think that if a specialist were housed in the health centers for special children, if there were at least someone we could go and consult with, we would have been more successful to support our children during the pandemic."* Another parent made the following suggestion to address the difficulties faced during the pandemic: *"You know, my son never accepts distance education; he does not even want to sit on computer, you know, it's impossible to have him study on the internet. ... I wish we had teachers to work with him one-on-one... either in an empty classroom at school or in our house at least for 1 hour or 2 hours a day with the teacher one-on-one."*

### ***Different Educational Platforms Used***

Parents reported using different educational platforms to support development and learning of their children at home during the pandemic. These included applications developed by the Tohum Autism Foundation (a non-profit organization), Turkcell (a phone company), Turkish Radio and Television Kids (TRT Kids), Toddlev, and Otsimo, web-based platforms such as Morpa campus, and educational resources on YouTube, Instagram, and Facebook. One parent mentioned the following about the different platforms they used: *"With my child, we used the application from Tohum Autism Foundation. Turkcell had an application that we used sometime. They're a little alike, I guess. We got support that way... TRT Kids had a kindergarten application; we used that instead of him watching cartoons on the phone..."* Another parent interviewed reported their use of education platforms as follows: *"Many teachers, doctoral teachers, lecturers, professors, associations for individual with disabilities etc. organized live online trainings and programs on Instagram... There are websites opened after the pandemic that has activities to teach academic skill. Teachers prepared activities for these websites that were very useful for us, at least."*

### ***Relationships among Family Members***

As described earlier, some parents reported that the changes in their daily routines due to pandemic caused difficulties and problems in their relations with their children and spouses. Other participating parents, on the other hand, stated that family relationships were positively affected during the pandemic. Specifically, they reported that family ties were strengthened as they spent more time with their children and spouses. In addition, some parents stated that the relationship between siblings improved during these difficult times. A participant summarized the positive effects of the pandemic on their relationship with their children as follows: *"You know, we played games together at home. We played different games in our backyard. You know, we are more connected to each other during the pandemic."* Another participant stated the positive effects of the pandemic on his relationship with his wife as follows: *"During the pandemic, our family became more connected. Because we switched to work remotely, I was always at home helping my wife etc. We are definitely more connected to each other now."* Another parent gave the following example of the positive effect of the pandemic on the relationships between siblings: *"The brothers bonded more; they spent more time together... they tried to play games together more often... I think it help my son with autism."*

### ***Supports Families of Children with Disabilities Needed to Cope with Challenges Faced***

As shown in Figure 1, two sub-themes grouped under the Family's Daily Life and Children's Education themes were used to answer the third research question: (a) types of supports needed and (b) family education and training.

#### ***Types of Supports Needed***

Data under this sub-theme showed that among the supports needed by parents to cope with the challenges faced during the pandemic were psychological support due to the increasing anxiety, economic support, educational support to increase quality of learning at home, and opening special education schools during summer period in order to close the gap for children with disabilities.

Intensity of supports needed increased as the severity of the child's disability increased. A participant expressed the support they needed during the pandemic as follows: *"Actually, our most important thing was psychological... If we had received psychological support, we would get over it faster, I think it wouldn't take that long. We needed a separate psychological support for both us and the child..."* Another participant explained their support needs as follows: *"With my child, the school must continue with no interruption even during summer. We don't go to vacation so that he continues to receive services. We needed special education and therapy services to continue during the pandemic. Not online, but face-to-face, one-on-one. It is imperative for our children to have uninterrupted services in schools."*

### ***Family Education and Training***

Parents reported training needs in a number of different areas to support development, leaning and overall well-being of their children while they are at home during the pandemic. These included training in behavior management, interventions during crisis such as tantrums and prolonged crying, teaching strategies to support language, academic and play skills, child development, nutrition, toilet training, and sexual education. One of the parents who participated in the interviews expressed their training needs as follows: *"... family training can be given about behavioral problem; we are burnt out and overwhelmed... practical strategies to use at home would really be helpful..."* Similarly, another participant expressed his views on family training needs as follows: *"I needed to learn how to approach to my child. A training on child development... Because teachers approach my child different then we do... Then, my child struggles and does not know what to do, frankly... A piece of information on any subject..."*

## **DISCUSSION**

During the COVID-19 pandemic, many precautionary measures were taken to reduce the spread of the virus in public spaces. Many individuals began to work remotely from home or lost their jobs because of the economic impact of the pandemic. Moreover, children continued their education through virtual learning environments due to school closures. These and other factors have impacted all families including those who have children with disabilities by significantly changing daily routines. In the current study, using a qualitative approach, we investigated the challenges faced by families of children with disabilities during the COVID-19 pandemic; examined the strategies and resources families used to address these challenges; and identified the supports the families needed to cope with them. In this section, the main findings of the current study are discussed on the basis of the relevant literature.

### **Challenges Parents Faced During the Pandemic**

#### ***Challenges Regarding Children***

In this study, parents stated that the most basic problems they encountered with their children during the pandemic are "not being able to go to school (interruption of education), not being able to socialize, and having to be locked at home". Mandatory isolation to prevent the spread of virus have restricted children's access to other people and the services they need. Although the pandemic has resulted in many issues in terms of education for all children (Başaran & Aksoy, 2020), children with disabilities who are in need of extensive healthcare services, individualized and systematic instruction and special education services are among the most affected groups as their mental health can be more fragile (Garbe et al., 2020). Findings of the current study supports the findings of earlier studies reporting that children with disabilities have significant limitations in accessing therapy services, special education adaptations, and materials during the pandemic (Warner-Richter & Lloyd, 2020)

Studies conducted during the pandemic have reported that children's sleep and eating habits were disrupted and their addiction to technology increased (Basaran & Aksoy, 2020). Findings of the current study also shows that daily routines of families were disrupted due to social restrictions and

stay-at-home orders. These included changes in children's sleep routines (i.e., increased or decreased time in sleep), increase in the frequency of taking bath due to fear of the infection, increase in non-educational use of devices such as phones, tablets and computers, and loss of appetite.

Another negative effect of staying home for extended period of time and not being able to go out is the increase in the problem and compulsive behaviors of children. Especially the frequency of obsessive, aggressive, and disruptive behaviors as well as anger and tantrums used to get attention and opposition increased. Moreover, children's mobility in the house and their fear of being infected increased as the pandemic progressed. Studies in the literature have reported similar findings. For example, Alhuzimi (2021) found that young children's problem and compulsive behaviors increased during the pandemic. Studies investigating the impact of the COVID-19 pandemic on children with disabilities have reported that home closure measures reduced children's motivation, social interactions and negatively impacted their behaviors such as resisting to wear a mask or frequently wash hands (Brown et al., 2020). Moreover, mental health problems among children, including emotional and behavioral difficulties (anxiety and depression) has significantly increased during the pandemic (Basaran & Aksoy, 2020; Racine et al., 2020).

In addition to behavioral problems, findings of this study showed that children's development was also negatively affected during the pandemic, primarily in the areas of language and communication, academic, independent living (e.g., self-eating ability) and social skills. Garbe et al. (2020) stated that parents were afraid that their children staying away from the school during the pandemic would negatively affect their social and academic development. Parents are also concerned that the loss of special education services and social participation opportunities during the pandemic will have long-term negative effects on their children (Rakap et al., 2022).

The impact of these changes in children's daily routines and behaviors has become more significant as the in-person therapy supports, and special education services are interrupted during the pandemic. This has required re-thinking of how to support children with disabilities and their families during a pandemic. Alhuzimi (2021) suggests the development and implementation of technology-supported parent education programs focused on maintaining routines and addressing aggressive or repetitive behaviors of children. Delivered using web-based technologies, these programs should offer parents practical strategies that can be used in home environment with little support from professionals. For some children and families, these supports may not be sufficient. Therefore, institutions serving children with disabilities and their families should develop a protocol regarding how face-to-face sessions will be maintained during a pandemic within the limits of rules and requirements imposed by the governmental authorities.

### ***Challenges Regarding Virtual Learning***

With the closure of the schools, children started to receive their education using information and communication technologies through a government-supported system (i.e., EBA) in the home environment. Families faced many technological and pedagogical difficulties during this virtual learning process. The most important challenge expressed by parents regarding the virtual learning process was that the contents in EBA were not suitable for the level and needs of their children; therefore, children minimally benefit from EBA. Ayda et al. (2020) also reported that distance education practices were not adequate to meet the needs of children with disabilities as the educational materials and content are not suitable for most children with disabilities. In addition, the use of inadequate or inappropriate materials and content reduce children's motivation for learning (Garbe et al., 2020).

Other challenges reported by parents in terms of virtual learning and distance education includes children getting bored quickly, wanting to play games only on the computer and getting distracted more quickly. Tso et al. (2020) reported that use of technological devices for gaming and entertainment have increased after school closure for children with disabilities. In addition to child-level challenges, many parents also faced difficulties in relation to technology use during virtual

learning. This included lack of technological devices such as computers, tablets, and televisions in the home environment, lack of or very weak internet connection, insufficient internet data plan, lack of parental knowledge in using information and communication technologies. Moreover, some parents emphasized that they could not support their children's learning due to the increasing intensity of house chores during the pandemic.

To address changes children with disabilities and their families encounter, technological resources should be enriched in order to ensure these children benefit from educational opportunities at the highest possible level (Masonbrink & Hurley, 2020). Moreover, it is necessary to make further adaptations of educational resources and materials used during virtual learning to address individual needs and level of children with disabilities (Rakap et al., 2023). In addition, families that do not have resources (e.g., devices, internet, data plan) and skills for their children to benefit from virtual learning opportunities should be provided technology support and training to gain necessary skills to use technology to enhance their children development and learning.

### ***Challenges among Family Members***

Some participants in this study reported that they experienced more frequent tensions with their spouses during the pandemic compared to the past. A recent study has asserted that as a result of social isolation and the increase in time spent together in the home environment, spouses feel more pressured; therefore, domestic conflicts and even divorce rates increase (Ahmen et al., 2020). In addition, different studies have reported pandemic-specific mental health problems and strained family relationships (Evans et al., 2020; Prime et al., 2020). Findings also revealed that relationships among children in the same family were affected during the pandemic in that siblings demonstrated increased level of negative behaviors towards each other. Studies have emphasized that the pandemic and associated restrictions may increase the probability of problems between siblings, and such a deterioration in sibling relationships may put families at risk for relational disconnection and stress (Prime et al., 2020). Moreover, Tippet and Wolke (2015) associated factors such as economic difficulties, changing routines in the home environment, and constant TV exposure to high aggression among siblings.

Contrary to these findings, some participants in this study reported that increased time spent with their spouses at home during the pandemic has strengthened family ties and relationships with their spouses. In parallel with this finding, a recent study found that family relations have been strengthened due to the fact that family members attach more importance to supporting each other, taking care of each other and being harmonious in the family during the pandemic (Bentenuto et al., 2021; Ergul & Yilmaz, 2020). Moreover, families who stated that they had the opportunity to find new hobbies, develop positive qualities such as appreciation, gratitude and tolerance were not negatively affected by social restrictions (Evans et al., 2020). These findings suggest that social restrictions and stay-at-home orders due to the pandemic have increased the time spouses spent together and this, in turn resulted in increased positive intra-family interactions (Başaran & Aksoy, 2020) which contributes to the formation of stronger marital ties, and can positively affect marital relationships (Ahmen et al., 2020).

Systematic psychological support provided through e-consultancy models may be beneficial to families that have struggled with family relationships during the pandemic (Tsibidaki, 2021). In addition, considering that the social support children with disabilities and their families receive during the pandemic is a protective factor to alleviate negative impact of the pandemic on family interactions (Rakap et al., 2022), e-consultancy practices or other web-based supports can be used to provide social support to all family members (Tsibidaki, 2021).

### ***Challenges in Meeting Individual Needs***

The increase in household chores, time required for the care and education of the children, hand washing and general hygiene behaviors due to the fear of infection, and the decrease in social

support and the time that the participants allocate for themselves are among the daily challenges reported by parents. In addition to these daily challenges, some participants stated that they have concerns about their children's future as there may not be anyone to take care of the children if something happens to them. Therefore, they give more importance to increasing the independent living skills of their children during the pandemic. Recent studies have shown that parental burden has increased during the pandemic as parents have to take care of their children (Rakap et al., 2022), professional work (Brown et al., 2020), and house chores at the same time (Evans et al., 2020). These difficulties have caused mental burden on families and negatively impacted their psychology (Rakap et al., 2022).

Another challenge mentioned by participants was the increase in their workload and the emergence of new areas of responsibilities, as they have to manage their children's educational processes at home during the pandemic. This has created additional challenges for parents of children with disabilities. For example, parents had to follow the class schedule so that their children attend the classes on time; they did not know how to support their children's academic and play skills; and it was difficult to switch from parental role to the role of teacher. Parents also had difficulties in managing their children's behaviors which resulted in increased negative parental behaviors. Other studies have reported that in addition to parenting roles, the role of educator has been added to families (Cahapay, 2020; Warner-Richter & Lloyd, 2020); parents had to teach academic skills (Brown et al., 2020) as well as additional safety skills brought about by the pandemic (Cahapay, 2020). Telehealth and tele-rehabilitation practices (Bentenuto et al., 2021) can be used to provide families with web-based interventions and trainings to improve their competencies in these areas.

### ***Financial Challenges***

A significant challenge parents experienced during the pandemic was related to economy. Especially due to job loss, families had hard time in meeting the basic needs of their household and needed to act more economically by limiting non-essential expenses. Losing jobs (Brown et al., 2020; Warner-Richter & Lloyd, 2020) and experiencing economic difficulties (Evans et al., 2020; Prime et al., 2020) during the pandemic are among the important difficulties noted in the international literature. Considering the relationship between family quality of life and socioeconomic level, these findings are considered to be more important. In addition, there are findings in the literature that the economic distress caused by the pandemic makes family relationships difficult (Brown et al., 2020) and that increasing tension among family members can trigger domestic violence (Zhang, 2020). To lessen negative impact of financial difficulties, families should be offered financial assistance by the government such as stimulus payments, unemployment insurance, utility bill relief. Research has also shown that families with low socioeconomic status are more likely to be impacted by the pandemic (Rakap et al., 2022), therefore, this group should be the primary target for any financial support provided during the pandemic.

### ***Strategies and Resources Parents Used During the Pandemic***

In the current study, along with the challenges faced by parents during the pandemic, the strategies and resources they used to overcome these difficulties were also examined. Participating parents reported the use of strategies in relation to health such as using nutritional supplements and going out during more secluded hours to reduce the risk of contamination; in relation to education such as receiving supports from different teachers and other professionals, doing their own research using search engines, and asking for help from spouse, close family and friends; and in relation to mental health such as getting psychological support, spending time alone/on their own, thinking and being grateful for those who are worse off, praying and showing patience. Similarly, studies in the literature reported that parents try to overcome their problems by using religious coping methods and meeting other families who have children with disabilities. Aksoy and Demirli (2020) found that parents of children with disabilities see teachers as the most reliable source of information. However, they also use internet to gather information about topics related to their child's disability. In addition,

Scheffers et al. (2021) reported an increase in the use of distal methods of support such as telephone calls, video calling, and WhatsApp or text messaging during COVID-19 pandemic.

Although families of children with disabilities experience greater difficulties and concerns during the pandemic, they can activate mechanisms such as self-efficacy and resilience to protect their psychological balance and mental health (Tsibidaki, 2021). These mechanisms are important psychological resources for families to cope with the difficulties they face (Rakap et al., 2022). Research has shown that caregivers who received tele-rehabilitation and tele-consultation services have less depression, anxiety and stress symptoms. Therefore, psychological support services should be provided to improve coping skills and increase psychological resources of parents of children with disabilities using telehealth (Bentenuto et al., 2021), e-consultancy and e-support (Tsibidaki, 2021) practices.

### **Supports Parents Needed During the Pandemic**

Findings in relation to the supports that parents needed to overcome the difficulties faced during the pandemic have shown that primary support needed by parents was the psychological support to deal with their increasing anxiety. Supporting mental health is a priority in order for parents to cope with the high stress that occurs during the pandemic (Racine et al., 2020). The existence of family support is critical for the mental health of parents who have children with disabilities. For this reason, it is recommended to provide supportive counseling services focused on family interactions and parenting to parents of children with disabilities during the pandemic (Ergul & Yilmaz, 2020). Several parents in the current study reported that they needed more financial support due to their declining income during the pandemic. Declining income and economic difficulties can increase family stress and reduce the quality of life as their access to basic life needs may be limited. In this direction, it is an inevitable necessity to provide financial support to families during the pandemic in order to increase their access to essential needs and services.

With the closure of schools during the pandemic, children had to continue their education using information and communication technologies from home through virtual learning and distance education. The responsibility of facilitating virtual learning at home falls on the parents. However, in this study, parents reported that they did not feel themselves competent in supporting their children's development and learning. In addition, participants noted that they need training on technology use, behavior management, nutrition, supporting academic, language and communication skills. Studies in the literature also reveal that parents find the help and support offered to them during the pandemic insufficient. These findings highlight the need for ensuring that families have easier access to intervention programs and services during the pandemic (Racine et al., 2020). To this end, researchers have suggested that telehealth practices (Bentenuto et al., 2021), tele-rehabilitation and homecare therapy, web-based interventions, and e-counseling/e-support (Tsibidaki, 2021) can be used to psychological supports to parents during the pandemic. Nevertheless, systemic changes are needed, especially for socioeconomically disadvantaged families to have easier access to support services.

**Acknowledgments:** We thank Dr. Campbell McDermid for reading earlier drafts of this manuscript and providing valuable feedback. We also thank the anonymous reviewers whose comments and suggestions helped improve this manuscript.

Correspondence concerning this article should be addressed to Salih Rakap, Department of Special Education, Ondokuz Mayıs University and Department of Specialized Education Services, University of North Carolina Greensboro, E-mail: s\_rakap@uncg.edu

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

**Conflicts of Interest:** The author declares no potential conflict of interest in this study..



**Funding Details:** Work described in this article was supported by the Grant # 120K259 from The Scientific and Technological Research Council of Turkey (TUBITAK). The opinions expressed are those of the authors, not the funding agency.

**CRedit Author Statement:** The authors contributed equally to the study reported in this paper. The first and second authors took the lead in writing the paper.

**Ethical Statement:** Ethical approval was obtained from the Ondokuz Mayıs University Social Science and Humanities Research Ethic Committee (Protocol Number: 2020/304) prior to research activities. Signed informed consent forms were obtained from participants prior to interviews.

## REFERENCES

- Ahmen, D., Buheji, M., & Fardan, S. M. (2020). Re-emphasising the future family role in “care economy” as a result of covid-19 pandemic spillovers. *American Journal of Economics*, 10(6), 332-338. <https://doi:10.5923/j.economics.20201006.03>
- Aksoy, M., & Demirli, C. (2020). Examination of the situation of mothers with mental disabilities to cope with the difficulties they may face: Implementation of a family support training program. *Education Sciences*, 15(3), 73-84.
- Alhuzimi, T. (2021). Stress and emotional wellbeing of parents due to change in routine for children with Autism Spectrum Disorder (ASD) at home during COVID-19 pandemic in Saudi Arabia. *Research in Developmental Disabilities*, 108, 103822.
- Ayda, N. K., Bastas, M., Altinay, F., Altinay, Z. & Dagli, G. (2020). Distance education for students with special needs in primary schools in the period of COVID-19 epidemic. *Propósitos y Representaciones*, 8(3), 587. <http://dx.doi.org/10.20511/pyr2020.v8n3.587>
- Basaran, M., & Aksoy, A. B. (2020). Parents’ views on the family lives in the coronavirus outbreak process. *The Journal of International Social Research*, 13(71), 668-678.
- Bentenuto, A., Mazzoni, N., Giannotti, M., Venuti, P., & de Falco, S. (2021). Psychological impact of Covid-19 pandemic in Italian families of children with neurodevelopmental disorders. *Research in Developmental Disabilities*, 109, 103840.
- Brown, S. M., Doom, J. R., Lechuga-Peña, S., Watamura, S. E., & Koppels, T. (2020). Stress and parenting during the global COVID-19 pandemic. *Child Abuse & Neglect*, 110(104699), 1-14. <https://doi.org/10.1016/j.chiabu.2020.104699>
- Cahapay, M. B. (2020). How Filipino parents home educate their children with autism during COVID-19 period. *International Journal of Developmental Disabilities*, 1-4. <https://doi.org/10.1080/20473869.2020.1780554>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage.
- Durukan, İ., Erdem, M., Tufan, A., & Türkbay, T. (2010). Coping strategies and relation of coping strategies with depression and anxiety levels of mothers of children with pervasive developmental disorders. *Çocuk ve Gençlik Ruh Sağlığı Dergisi*, 17(2), 75-82.
- Ergul, B., & Yilmaz, V. (2020). Examination of family relationships during the COVID-19 outbreak with confirmatory factor analysis. *IBAD Sosyal Bilimler Dergisi*, 38-51.
- Evans, S., Mikocka-Walus, A., Klas, A., Olive, L., Sciberras, E., Karantzas, G., & Westrupp, E. M. (2020). From ‘It has stopped our lives’ to ‘Spending more time together has strengthened

- bonds': The varied experiences of Australian families during COVID- 19. *Frontiers in Psychology*, 11, (588667), 1-13. <https://doi.org/10.3389/fpsyg.2020.588667>
- Garbe, A., Ogurlu, U., Logan, N., & Cook, P. (2020). Parents' experiences with remote education during COVID-19 school closures. *American Journal of Qualitative Research*, 4(3), 45-65. <https://doi.org/10.29333/ajqr/8471>
- Masonbrink, A. R., & Hurley, E. (2020). Advocating for children during the COVID-19 school closures. *Pediatrics*, 146(3). <https://doi.org/10.1542/peds.2020-1440>
- Narzisi, A. (2020). Handle the autism spectrum condition during coronavirus (COVID-19) stay at home period: Ten tips for helping parents and caregivers of young children. *Brain Sciences*, 10(4), 207. <https://doi.org/10.3390/brainsci10040207>
- Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist Association*, 75(5), 631-643.
- Racine, N., Cooke, J. E., Eirich, R., Korczak, D. J., McArthur, B., & Madigan, S. (2020). Child and adolescent mental illness during COVID-19: A rapid review. *Psychiatry research*, 292(113307). <https://doi.org/10.1016/j.psychres.2020.113307>
- Rakap, S., Vural-Batik, M., Kalkan, S., Karnas, M., Sarı, H.I., & Bayrakdar, U. M. (2022). The hidden (overlooked) impact of living through a pandemic: How parents of children with disabilities fared during COVID-19? *Frontiers in Education*, 7, 827230. <https://doi.org/10.3389/educ.2022.827230>
- Rakap, S., Karnas, M., Bayrakdar, U., Kalkan, S., Vural-Batik, M., & Sari, H. I. (2023). Virtual learning is not for my child! A parental perspective of practices used with children with autism during the pandemic. *International Online Journal of Education and Teaching*, 10(2), 1821-1847.
- Scheffers, F., van Vugt, E., & Moonen, X. (2021). Assessing the quality of support and discovering sources of resilience during COVID-19 measures in people with intellectual disabilities by professional carers. *Research in Developmental Disabilities*, 111, 103889.
- Tippett, N., & Wolke, D. (2015). Aggression between siblings: Associations with the home environment and peer bullying. *Aggressive behavior*, 41(1), 14-24.
- Toseeb, U., Asbury, K., Code, A., Fox, L., & Deniz, E. (2020). Supporting families with children with special educational needs and disabilities during COVID-19. *PsyArXiv*, <https://doi.org/10.31234/osf.io/tm69k>
- Tsibidaki, A. (2021). Anxiety, meaning in life, self-efficacy and resilience in families with one or more members with special educational needs and disability during COVID-19 pandemic in Greece. *Research in developmental disabilities*, 109, 103830.
- Tso, W. W., Wong, R. S., Tung, K. T., Rao, N., Fu, K. W., Yam, J. C., . . . & Ip, P. (2020). Vulnerability and resilience in children during the COVID-19 pandemic. *European Child & Adolescent Psychiatry*, 1-16. <https://doi.org/10.1007/s00787-020-01680-8>
- United Nations. (2020). Policy brief: The impact of COVID-19 on children. <https://unsdg.un.org/resources/policy-brief-impact-covid-19-children>
- Warner-Richter, M., & Lloyd C. M. (2020). Considerations for building post-covid early care and education systems that serve children with disabilities. *Child Trends*.

Zhang, H. (2020). The influence of the ongoing COVID-19 pandemic on family violence in China.  
*Journal of Family Violence*, 1-11. <https://doi.org/10.1007/s10896-020-00196-8>

## **The Destruction Seen in Disadvantaged Bilingual Students in Rural Regions of Turkey: A Theoretical Study of Sad Portraits**

**Yusuf Kızıltas<sup>i</sup>**

Van Yüzüncü Yıl University

### **Abstract**

There are significant numbers of disadvantaged bilingual students in rural areas of Turkey, such as Southeastern and Eastern Anatolia. These students face various problems, especially while acquiring Turkish as a second language. Each of the emerging problems represents a sad portrait. So much so that almost all of these portraits reflect some harsh truths in our faces. Revealing sad portraits is very important. Because most of these situations lead to irreparable results, the effects of the damage they cause cannot be erased. Purposes such as better explaining the distinction between looking and seeing, presenting the traumas and destructions inherent in this narrative, and revealing the realities and results boldly make the study meaningful. So as to achieve this aim, a literature review was conducted on disadvantaged bilingual students. Then, the studies on this subject were examined and the relevant information was revealed and evaluated. In this theoretical research, which is a first in the context of literature in Turkey, sad portraits representing disadvantaged bilingual students in rural areas are discussed. Sad portraits; absenteeism and early school leaving, child marriages, uninsured child labor, juvenile delinquency, substance abuse, academic failure. Each sad portrait causes serious problems in the long run.

**Keywords:** Rural Regions, The Bilingual Students, The Sad Portraits, Destructions

**DOI:** 10.29329/ijpe.2023.534.4

**Submitted:** 25/07/2021

**Accepted:** 27/02/2023

**Published:** 01/04/2023

---

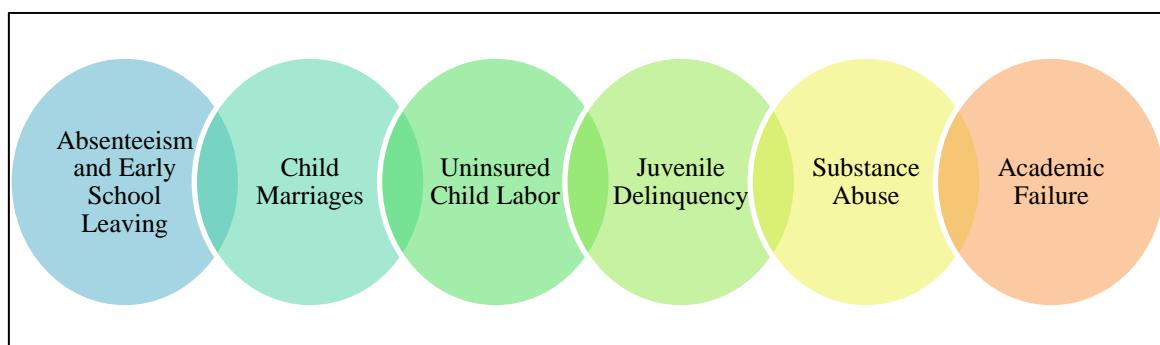
<sup>i</sup> **Yusuf Kızıltas**, Asst. Prof. Dr. Primary School Education, Education Faculty, Van Yüzüncü Yıl University, ORCID: 0000-0001-9434-4629

**Email:** yusufkiziltas@yyu.edu.tr

## INTRODUCTION

There are many bilingual students (Düzen, 2017; Pekgenç, 2019) in the Southeastern and Eastern Anatolian regions of Turkey. Compared to the other five geographical regions of Turkey, bilingual students attending schools in the rural areas of these two regions face serious disadvantages in various fields (Aytekin & Yılmaz, 2018; Canpolat, 2020; Emin, 2019; Erol & Özdemir, 2020; MEB, 2020; Kulaksız, 2008; Uğur, 2017) can be said to be intertwined with problems (Asrağ, 2009; Çoşkun, Derince, & Uçarlar, 2010; Kırmızı, Özcan & Şencan, 2016; Özdemir, 2016; Yalçın, 2017; Yılmaz & Şekerci, 2016). Especially due to the inability to acquire Turkish as a second language (Aytekin & Yılmaz, 2018; Canpolat, 2020; Kızıldaş, 2021), various devastations occur in bilingual students in rural areas (Alaca, 2011; Aytekin & Yılmaz, 2017; Derince, 2012; Emeç, 2011; Pekgenç, 2019; Tulu, 2009; Uğur, 2017; Yazıcı & Temel, 2012) are inevitable. Each of the resulting destructions is a disadvantage in the context of bilingual students (Alaca, 2011; Canpolat, 2020), themed sad portraits. It is worth noting that sad portraits contain stories, omissions, mistakes (Uğur, 2017) that are serious and need to be questioned at their core. It is also possible to see the findings related to this situation in various researches (Aytekin & Yılmaz, 2018; Yılmaz & Şekerci, 2016). Exposing sad portraits bearing sections from disadvantaged bilingual students (Canpolat, 2020) makes them accessible to the community, developing solutions (Öztepe, 2019; Taşkaya, Turhan & Yetkin, 2015). So much so that sad portraits, which are symbols of the resulting destruction, will often not be compensated for in disadvantaged bilingual students (Ceyhan & Koçbaş, 2011; Çelikten, Şanal & Yeni, 2005) dimensions.

It is also an important issue that the sad portraits were drawn by whom and for what reasons/pencils. Your portraits; Communication, inability to acquire basic language skills, Turkish-Kurdish language conflict, language/culture shock in teachers, lack of pre-school education, intense teacher mobility, paid teaching (Aytekin & Yılmaz, 2018; Biçer & Alan, 2018; Canpolat, 2020; Eğitim-Bir-Sen Report, 2019; Gözüküçük & Kıran, 2018; Kırmızı, Özcan & Şencan, 2016; Kızıldaş, 2021; Kozikoğlu & Senemoğlu, 2018; Pekgenç, 2019; Sarı, 2001; Su, 2020; Taşkaya, Turhan & Yetkin, 2015; Turan, 2019; Uslu, 2017; Uygun, 2013; Yalçın, 2017; Yılmaz & Şekerci, 2016) can be said to be nourished and supported. Many of the reasons explained are almost ink reinforcement to the pens that paint the portrait. For these reasons, it is necessary to share the promotional brochure of the exhibition of sad portraits presented to society (Figure 1). In other words, after presenting a general portrait of the portraits, it may be more accurate to start wandering around the sections of the exhibition.



**Figure 1** Sad Portraits of Disadvantaged Bilingual Students

Each of the destruction that occurs in disadvantaged bilingual students represents a sad portrait (Figure 1). Therefore, it is of great importance that each of these portraits, which are stated to cause significant problems and consequences in the long run, should be discussed separately: Welcome to the exhibition of sad portraits of disadvantaged bilingual students!

### Purpose, and Method of the Study

There is a lack of studies that reveal the damage caused by the learning losses experienced by bilingual students who acquire Turkish as a second language in the context of various factors. It is also necessary to draw attention to the deficiency in this area by discussing that the negativities caused by the inability to acquire Turkish sufficiently should not be limited to purely academic failure. The aim of the study is to reveal and discuss the sad results that occur in bilingual students and the factors that affect these results. The realization of this discussion based on the research results in the literature makes the study a compilation research. In the context of the stated objectives, answers to the following research questions were sought:

1. What are the reflections of not being able to acquire Turkish enough on absenteeism and early school leaving?
2. What is the role of not being able to acquire a language in the emergence of child marriage in bilingual students?
3. What are the dimensions of uninsured child labor among bilingual students?
4. What is the level of substance use and addiction among bilingual students?
5. How does not being able to acquire Turkish adequately reflect on the academic failures of bilingual students?

## **FINDINGS**

### **Sad Portraits**

#### **Absenteeism and Early School Leaving**

The phenomenon of early school leaving (Gil et al., 2018), which is affected by various factors, is that students do not attend school during the compulsory education years (Álvares & Estevão, 2013) or give up the right to receive a diploma at the end of the education process. It is considered an undesirable situation in that it causes the resources of the society to be wasted and prevents qualified individuals' training (Kartal & Ballı, 2020). In disadvantaged bilingual students in Turkey; the existence of cases that start with absenteeism eventually result in early school leaving (E.U. The report, 2005; Sincar, 2015) is an important fact (ERG, 2018). These risk factors that await many bilingual students ultimately reveal a sad portrait. Şimşek and Şimşek (2013) state that especially when it comes to the secondary education level, the tendency of students in rural areas to drop out (Adelman & Székely, 2016) gets stronger, and this situation results in early school leaving. He emphasizes that this situation also becomes a barrier to integrating bilingual children into society, making them disadvantaged (Hunt, 2008; Uğur, 2017).

Early school leaving; It is more common in students whose first language is Kurdish/Arabic (Şimşek, 2011; Şimşek & Şahin, 2012), who have low academic achievement, have problems with socio-cultural and family issues. Likewise, it is seen intensely in immigrant, insufficient/low socio-economic families (Rodriguez et al., 2020; Rumberger, 2001). School dropout compared to urban students (Chin, 2015). Disadvantaged bilingual students (ERG, 2011; Fırat, 2015) in rural areas of Turkey's Southeastern and Eastern Anatolian regions are experienced more intensely (Gökşen, Cemalcılar & Gürlesen, 2006). Similarly, Rumbaut (1995) states that early school leaving may be inevitable for bilingual students in rural areas (Podešvová, 2017) if the second language cannot be acquired sufficiently (Chin, 2015; Hunt, 2008). Likewise, in the UNESCO (2015) report, it is seen that learning a second language other than the mother tongue (Sincar, 2015; Uğur, 2017) and the failure to overcome the resulting language barrier (Mokibelo, 2014) have a significant impact on early school leaving (Huang, 2005).

Other factors also play an essential role in absenteeism and early school leaving. Gender factor is very effective in early school leaving in bilingual students. Boys represent a significant proportion at this point. Şimşek (2011) attributes this situation to the efforts to eliminate low living standards and contribute to the family budget. In fact, according to the O.E.C.D. (2020) report, with the Covid-19 pandemic, especially male students in rural areas were more likely to drop out of school in this sense. On the other hand, Subrahmanyam (2016) underlines that bilingual female students in rural areas have a higher early school leaving due to social norms. Küçüker (2018) explains this situation with distrust of girls, the hopelessness that they will be successful, and the dominance of conservative thinking.

The long-distance between school and home, early marriage, grade repetition, dissatisfaction with the teacher and the school, the schools do not offer sufficient socio-cultural opportunities, the school environment with various negativities, the difficulties created by the education programs, the high number of siblings in the family, the family indifference other reasons for early school leaving can be listed as factors such as insufficient teacher capacity, negative attitudes/behaviors of teachers, separation of parents, low educational level of parents. Therefore, early school leaving cannot be reduced to a single cause (Küçüker, 2018). However, it is also worth remembering that there is still no detailed database in Turkey on such a sensitive issue (Shafique, 2013; Gil et al., 2018; Hoşgör & Smits, 2006; Kartal & Ballı, 2020; Mokibelo, 2014; Ntelele Mohloua, 2014; Özdemir, Şirin & Sezgin, 2009; Özdemir et al., 2010; Rodriguez et al., 2020; Şimşek, 2010, 2011; Yokozeki, 1996). In summary, it is possible to evaluate early school leaving under three headings as an individual, familial and social (Nikolaou, Papa, & Gogou, 2018). On the other hand, Yokozeki (1996) evaluates the reasons for early school leaving as student-parent, school-system. These titles are essential in terms of revealing the sensitivity of early school leaving. Furthermore, Rodriguez et al. (2020) also point out that early school leaving is a severe issue, causing economic losses (Yılmaz & Şekerci, 2016), and its cost to society is hefty (Nikolaou, Papa & Gogou, 2018; Shannon & Bylsma, 2016). These factors and facts are valuable in better understanding the importance of early school leaving and this sad portrait.

### **Child Marriages**

Child marriages among disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions (Orcan & Kar, 2008) represent a sad portrait (Kaptanoğlu & Ergöçmen 2012). The concepts with which this situation is most related to can be explained as absenteeism, early school leaving (Öğülmüş et al., 2013), economic and socio-cultural deficiencies (Uysal, Eren, & Şimşek, 2019), mother tongue difference (Kaptanoğlu & Ergöçmen, 2012; Smith, Stone & Kahando, 2012). Mokibelo (2014) states that early marriages are a result or cause of early school leaving (Hunt, 2008; Liu, 2014; Malatyali, 2014). He emphasizes that this process has started to take place since the primary school level. However, at this point, he draws attention to the fact that sometimes girls may be willing to early school leaving for emotional reasons. In Eastern and Southeastern Anatolian regions, wedding dresses are seen as a control mechanism, especially for girls not sent to school (Burcu et al., 2015).

The number of girls in early marriages at a young age is higher, and the age range in these marriages decreases to 12-13 (Öğülmüş et al., 2013). Similarly, Shafique (2013) states that early school leaving is more common among students, especially in rural areas, and states that one of the saddest consequences of this situation is the early marriage of girls and boys. Furthermore, girls cannot overcome the barrier of acquiring a second language, and the pessimism created by a long education process accelerates the removal of girls from school (Köseli & Çelik, 2020). Finally, the slightest presence of girls' unsuccessful performance at school can be enough to be a driving force for early marriage (Smith, Stone, & Kahando, 2012). Sad portraits of child marriages are shown in image 1.



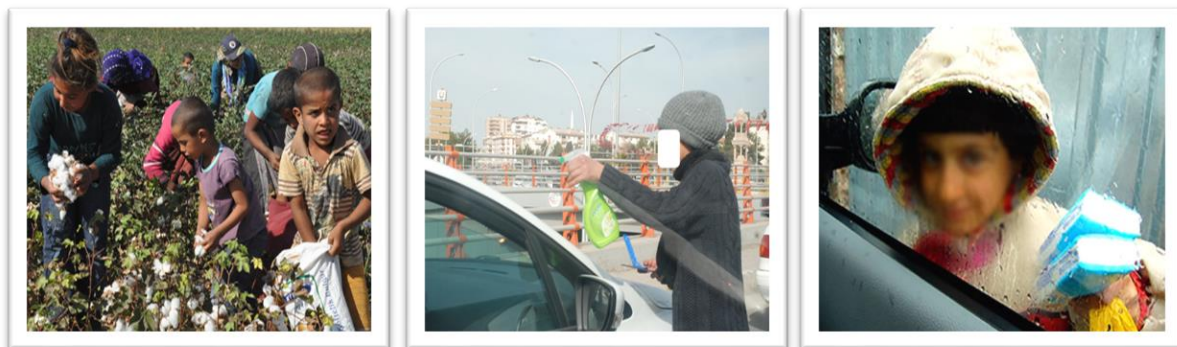
**Image 1** Sad Portraits Created by Child Brides

(Reference: [sehrivangazetesi.com](http://sehrivangazetesi.com), [gazetegercek.com.tr](http://gazetegercek.com.tr), [www.sabancivakfi.org](http://www.sabancivakfi.org))

In summary, child marriage is more common among girls whose mother tongue is Kurdish and Arabic in rural and even urban areas than children in other regions. This situation can be considered as one of the reasons that increase the risk of being a child bride (Kaptanoğlu & Ergöçmen, 2012; Sözer, 2020; Zeyneloğlu, Civelek & Coşkun, 2011). The fact that mother tongue difference triggers child marriage is quite striking when compared to other reasons.

### **Uninsured Child Labour**

It is known that uninsured, that is, without social security, child labor (Öğülmüş et al., 2013) is more common (Gün, 2017) among disadvantaged bilingual students in rural areas of Eastern and Southeastern Anatolian regions of Turkey. This negativity also reveals a sad portrait. Uninsured child labor can be associated with many situations. It should be said that poverty, absenteeism, and early school leaving, especially in rural areas, cause child labor (Amao, Oni, Yusuf, & Omonona, 2010; Yaman & Yılkan, 2019). In this context, Rodriguez et al. (2020) draw attention to the relationship between early school leaving and uninsured child labor by stating that rural students who leave school early enter low-paid jobs with low benefits for them. On the other hand, according to the O.E.C.D. (2020) report, with the Covid-19 pandemic, male students in the rural areas left school early and started working in various jobs. While noting that this situation is inevitable to contribute to the family budget and close the income gap, it says that female students also work from time to time. Therefore, child labor ultimately emerged. Likewise, Ntelele Mohloua (2014) states that socio-economic deficiencies lead to early school leaving and that this situation results in child labor (Yokozeki, 1996). Therefore, poverty triggers this situation seriously. In bilingual students whose mother tongue is different, informal forms of child labor such as selling handkerchiefs on the street, painting, collecting paper-coal, seasonal agricultural work, and apprenticeship represent a significant proportion (image 2).



**Image 2** Children Wiping Windows, Children Selling Handkerchiefs and Seasonal Agricultural Worker Children

(Reference: [urfahaber63.com](http://urfahaber63.com), [ozgurkocaeli.com.tr](http://ozgurkocaeli.com.tr), [www.urfahaber63.com](http://www.urfahaber63.com))



In addition, it can be considered as a necessary form for disadvantaged bilingual students to go to the western provinces of Turkey and work in construction. Therefore, child labor, which falls until 8, causes absenteeism at school (Asrağ, 2009; I.L.O., 2004; Özen et al., 2005; Yaman & Yılkan, 2019). The majority of the students working in the hazelnut fields in the Black Sea region of Turkey consist of children whose mother tongue is Kurdish (Yılmaz, 2017). Therefore, disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions experience more child labor. The mother tongue variable is an essential factor in affecting this situation.

### Juvenile Delinquency

It is a fact that the involvement of the child in crime (Al-Anazi & Al-Shamli, 2011), which is considered an important problem in the world, is also essential in Turkey. The problem of involvement in crime (Karacelil, 2013) is more common among disadvantaged bilingual students in rural and urban areas of Turkey's Eastern and Southeastern Anatolian regions. The problem of child criminalization is defined as 'juvenile delinquency' in the literature (Özen et al., 2005) and includes the delinquency of children under the age of 18 (Rathinabalan & Naaraayan, 2017), is affected by various reasons. Child abuse, the impact of mass media, regional impact, peer pressure, feuds, deficiencies in education, labeling of children, negative teacher attitudes/attitudes, low socio-economic level, lack of supervision of parents, family apathy, migration, terrorism, low level of education of families, crowded family structure causes the child to become involved in crime (Çıfci, 2008; Ekinici, 2016; Ferdoos & Ashiq, 2015; Özen et al., 2005; Raselekoane et al., 2019; Rathinabalan & Naaraayan, 2017; Sakuta, 1995; Slomkowski et al., 2001). Rodriguez et al. (2020) also state that rural students who usually leave school (Raselekoane et al., 2019) or the area they live in early (Özen et al., 2005) become prone to committing crimes after child labor. This situation makes students vulnerable to entering prisons. He states that this destruction hurts the public conscience (Doll, Eslami, & Walters, 2013). Similarly, it draws attention to the fact that children who are considered minorities in the country are weaker in their education systems and are more likely to commit crimes.

The crimes committed by disadvantaged bilingual children vary widely. These crimes are usually; theft, wounding, murder, drug use, snatching, substance use, pickpocketing, participation in demonstrations related to terrorism and terrorism, etc. (Ekinici, 2016; Ferdoos & Ashiq, 2015; Özen et al., 2005). When we look at the E.U. Report (2005), children who burned the Turkish flag by getting involved in crime in Turkey in 2005, for example, are disadvantaged children whose mother tongue is Kurdish. In this situation, disadvantaged bilingual students can be considered as being put forward and used at the point of involvement in a crime. Along with the prejudices that have occurred, it is also seen that some disadvantaged bilingual students are described as 'stone-throwing children', 'children throwing stones at the police' (image 3).



**Image 3** Children Throwing Stones at Police, Children Damaging Public Vehicles and the Polices Try to Win These Children

(Reference: sozcu.com.tr, haberturk.com, yenisafak.com)

This term is an argument of communities and organizations that advocate acts of terrorism. It is necessary to be sensitive to ending this approach that feeds the purpose of terrorism. Otherwise, it

may become inevitable to create prejudices against bilingual students whose mother tongue is different and the people in the regions where these students live. Finally, social prejudices and negative perceptions gain legitimacy (Durna & Kubilay, 2010; Karacelil, 2013). In this respect, it can be effective to follow disadvantaged bilingual students in many subjects, including not falling behind in the education process.

### Substance Abuse

Substance abuse or addiction in disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions (Ekinici, 2016; Kurban & Yolaçan, 2008) represents a sad portrait. Disadvantaged bilingual students generally; substances such as cigarettes, drugs, cannabis, pills, and alcohol are used, and the students in this group are generally leaving school (Ekinici, 2016). These types of addiction are seen in urban and rural areas in the form of volatile substances such as thinner and bally and the use of cocaine and especially bonsai (Tomanbay, 2016; UNICEF, 2011; Yaşan & Gürgen, 2004). Likewise, Ekinici (2016) states that substance abuse is a significant problem, and treatment centers are needed for its treatment. Unfortunately, these bilingual students living in urban areas are left to their fate. However, this is not a problem limited to bilingual students. So much so that Tomanbay (2016) draws attention to the fact that children are dragged into the swamp of substance addiction, regardless of whether they are Turkish or Kurdish. He states that, especially in provinces such as Van, Bitlis, and Batman, the cries of families who lost their lives are not heard and that this problem will have a devastating effect on society in the long run. More importantly, the fact that the substance in question is elementary and cheap to obtain (especially bonsai) is the biggest reason for the age of addiction falling below 11. On the other hand, substances such as heroin are imported into Turkey, especially from Van, Ağrı, Hakkari (regions where bilingual students are dominant) (Duman & Akosman, 2021; E.M.C.D.D.A. Report, 2014). This situation is an essential factor in substance abuse or addiction in the region. Van is one of the provinces with the highest rate of substance abuse and use in Turkey (Duman & Akosman, 2021). Some striking sad portraits of substance abuse are shown in image4.



**Image 4** Children in the Bonsai Crisis, Shoot Bally, and Substance Addicts Treated in Rehabilitation Centers (The order of the photos in the bibliography)

(Reference: Gök, 2021, ilkehaberajansi.com.tr, cnnturk.com)

There are various reasons behind the substance abuse experienced by disadvantaged bilingual students. These reasons are; wannabes to friends, feelings of curiosity, high youth unemployment, easy access to substances, the cheapness of substances, limited employment opportunities, presence of substance users in the family, families with many children, low education levels of families, domestic communication, lack of socio-economic opportunities in individuals, etc. (Duman & Akosman, 2021; Yaşan & Gürgen, 2004). On the other hand, Mothibi (2014) students in rural areas; states that there is a significant relationship between the school environment, academic failure, early school leaving, teacher-student conflicts, aggression in students, and substance abuse. This relationship can also be considered a different example of revealing the situations that trigger substance abuse. Therefore, the substance abuse problem of some disadvantaged bilingual students in rural areas of Turkey has a serious dimension. Various reasons play an essential role in this problem.

## **Academic Failure**

Academic failure is perhaps one of the most notable sad portraits of many disadvantaged bilingual students in the rural areas of Eastern and Southeastern Anatolia. So much so that when we look at the results of both national and international exams, a more unsuccessful picture prevails in these regions compared to other regions of Turkey (M.E.B., 2019; Sarier, 2010; Şahin, 2018). There are many reasons for this problem. For example, intensive teacher mobility in schools where disadvantaged bilingual students study, inability to acquire basic language skills, pre-school education is not compulsory, paid teaching practice, deficiencies in the physical structure of schools, Turkish-Kurdish language conflict, reading comprehension problems, the inadequacy of Turkish vocabulary, teaching The need for materials, crowded classrooms can be explained as the most important reasons for academic failure (Esersin, 2017; Kızıldaş, 2021; Kırmızı, Özcan, & Şencan, 2016; Kırmızı et al., 2019; Oktay, 2012; Özdemir, 2016; Öztepe, 2019; Özoğlu, 2011; Sarier, 2010; Sincar, 2015; Yılmaz, 2016; Yılmaz & Şekerci, 2016). On the other hand, Canpolat (2020) mainly draws attention to the fact that the language at school (Turkish) is different from the language at home (Kurdish), and the time it takes to fill the gap created by this negatively affects academic achievement (Düzen, 2017; Fırat, 2015; Öztepe, 2019; Sincar, 2015). However, according to Asrağ (2009), this problem can be seriously prevented with effective Turkish teaching. Therefore, linguistic differences play a dominant role in the academic failure of disadvantaged bilingual students.

## **RESULTS, AND DISCUSSION**

In many disadvantaged bilingual students in the rural areas of Turkey's Eastern and Southeastern Anatolia regions, some problems arise when acquiring Turkish as a second language. In this context, the problems faced by the students whose first language is Kurdish grow with other problems over time and become an obstacle that is difficult to overcome. The problems that arise vary, and each one contains different causes, stories, tragedies, wrongs in essence. These various problems represent a sad portrait. In this research, the causes and consequences of what these portraits are discussed together.

The first of the sad portraits experienced by many disadvantaged bilingual students in the rural areas of Eastern and Southeastern Anatolia of Turkey can be expressed as absenteeism and early school dropouts. The most significant causes of this condition are; Inadequate acquisition of a second language other than the mother tongue, early marriages, grade repetition, negative attitudes of teachers, negativity in the school environment, family incompatibility, low socio-economic level, low level of education of parents, inadequate physical conditions of schools, etc. As a result, this situation can lead to early school leaving (Aladağ, 2016; Canpolat, 2011; Cömert, 2018; Yardımcı, 2018) by causing indifference towards school and lessons (Sarı, 2001). In particular, the inability to acquire a second language (Turkish) causes bilingual students to feel foreign (Fırat, 2015) and to feel not belonging to school (Alaca, 2011; Ceyhan & Koçbaş, 2009; Coşkun, Derince & Uçarlar, 2010; İnal, 2020; Sincar, 2015; Uğur, 2017). Therefore, it can be said that this situation also leads to absenteeism and dropout. According to the result of his research, Sincar (2015) draws attention to the fact that the relations between teachers and students who have a good level of Turkish are better. However, he emphasizes that the communication with the students who cannot learn Turkish is not good and that these students are absent. Therefore, it is stated that the problem is language-based. In the study conducted by Şimşek (2011), it was emphasized that language difference is effective in dropping out of school. Similarly, according to the ERG (2011) report, it is noted that absenteeism and early school leaving occur in regions where bilingual students live heavily. Fırat (2015), on the other hand, states that especially the difference in mother tongue is adequate in early school leaving. He states that this is also effective in school dropouts, which are common in the eastern regions. Uğur (2017), on the other hand, explains school dropouts with the refusal of bilingual students to speak their mother tongue at school. The situations also expressed by Coşkun, Derince & Uçarlar (2010) show a unique quality. Accordingly, bilingual students lag behind their peers while trying to learn Turkish skills while starting school. This causes them to fall behind in the curriculum, making students disadvantaged individuals, leading to absenteeism and early school leaving. The importance and necessity of practical

Turkish teaching skills for bilingual students become more apparent after these discussions. Not being able to learn Turkish at a reasonable level leads to early school leaving in the long run.

Child marriages are another sad portrait experienced by many disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions. Reasons such as early school leaving and absenteeism, socio-cultural deficiencies, low academic achievement in girls, pressures from the concept of morality, and tribal culture lead to child marriages. Moreover, the failure caused by the different mother tongues causes this problem in the long run. These results are consistent with various research results (Burcu et al., 2015). It is possible to come across this consistency in the research conducted by Kaptanoğlu and Ergöçmen (2012). In the Eastern Anatolia region, where children of Kurdish origin live predominantly, girls are married off at a young age. To put it more clearly; It is emphasized that 4 out of 10 girls are child brides. In order to overcome this problem, it can be said that primary education is essential and the family's mastery of second language skills is adequate (Smits & Hoşgör, 2006). On the other hand, Malatyalı (2014), who draws attention to the increase in early school leaving with child brides, also states that this problem is seen more intensely in the eastern regions. Tuğrul (2018), on the other hand, expresses similar thoughts and states that early marriage should not be limited to specific regions and draws attention to the fact that the problem is seen in many regions. The UNFPA (2020) report mentions that early marriage is associated with the difference in mother tongue and not being able to acquire Turkish enough. It is stated that when the teacher is not understood, there can be no learning, and this cannot be carried home as information, so this will create a prejudice against the school in the parents. With this prejudice, it is stated that the child will be removed from the school, considering that the school does not bring anything to the child. As a result, the child will become a seasonal agricultural worker or meet early marriage. As it can be understood from this information and results, not acquiring Turkish enough in bilingual students also triggers child marriage in the long run.

Uninsured child labor is another sad portrait of many disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions. The other reason for this problem, which arises from early school leaving, can be poverty or socio-economic deficiencies. In this context, informal forms of child labor such as selling handkerchiefs on the street, painting, collecting paper and coal, seasonal agricultural work, apprenticeship, and working in construction represent a significant proportion. Depending on the factors stated, it is understood that such practices seen in bilingual students are also encountered in different research results, and this causes significant problems (Kızıldaş, 2021; MGTİAR, 2014; TESEV, 2008; Yaman & Yılkan, 2019). In this respect, it can be said that the results of this study are consistent with the results of various studies. Yaman & Yılkan (2019) also draws attention to the fact that those who experience child labor in coal collecting are generally in disadvantaged areas in terms of education. Cömert (2018), on the other hand, states that children sometimes work to sell illegal cigarettes. On the other hand, Uğur (2017) also draws attention to the density of seasonal agricultural workers among students whose mother tongue is Kurdish. He states that it is compulsory and necessary for these children to use Turkish to continue child labor in their cities. He also draws attention to how they are exposed to various reactions when they use their first language. According to the MGTİAR (2014) report, it is understood that the majority of seasonal child workers are students whose mother tongue is Kurdish (Yılmaz, 2017). It is stated that these students do not attend school even though they are registered at the school. Likewise, Gün (2017) states that the children working on the street are mainly composed of students whose mother tongue is Kurdish. According to the TESEV (2008) report, to reduce uninsured child labor among Kurdish children, the teacher shortage in the region should be met, the needs of schools should be met, and material support should be provided. Furthermore, children who do not attend school should be ensured in the same way. So much so that because of these problems, it is stated that the eastern regions are at the bottom in the national exams. Ultimately, if these deficiencies are eliminated, it will be possible to learn Turkish language skills reasonably. This is very important in order to prevent student losses.

A crime is one of the sad portraits experienced by many disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions. According to the research results; child abuse, the effect of mass media, peer pressure, blood feuds, deficiencies in education, labeling

children, negative teacher attitudes/attitudes, low socio-economic level, lack of parental control, family indifference, migration, terrorism, low educational level of families, Situations such as crowded family structure exacerbate the problem of involvement in crime in children. Likewise, according to the results of this study, crimes are generally; theft, injury, murder, drug use, smuggling, drug use, pickpocketing, participation in demonstrations related to terrorism, and involvement in terrorism, etc., can be evaluated as. On the other hand, some children are involved in crime in society; It is also understood that they are described as 'children throwing stones at the police and 'children throwing stones at the police. İnal (2020) also draws attention to the fact that the academic failure of bilingual students and the low participation due to the lack of interest in the lessons result in traumatic behaviors. He states that due to the inability to acquire enough Turkish, students fail in the classroom and are dragged into early school leaving and have emotional breakdowns. Undoubtedly, involvement in crime can be considered as traumas waiting for students in this context. Coşkun, Derince &, Uçarlar (2010) also state that the difference in mother tongue creates some long-term problems especially for students of Kurdish origin. They emphasize that students have problems in reading and that they drop out of school early without reading and that this results in being dragged into crime. Therefore, he says that the rate of committing crimes is very high among children of Kurdish origin (İçli, 2016). Looking at UNICEF's (2011) report titled The Situation of Turkey, it is stated that children aged 12-17 are involved in crime in large cities where the Kurdish population is densely populated. Is being drawn. On the other hand, Toğa (2021) looks at the involvement of children in crime from different perspectives in this situation; family indifference, poverty, violence, the high number of children, the presence of other individuals who committed crimes in the family, etc. indicates that the factors are influential. However, he also emphasizes that the backwardness of his peers in language learning causes some unique problems and triggers conflicts in the long run. This is a common occurrence in neglected children. Yardımcı (2018) also contributes to these reasons; He states that working in unsafe and unhealthy jobs at an early age, the heterogeneous structure created by the urban environment, and peer pressure cause students whose mother tongue is Kurdish to commit crimes. It draws attention to the fact that schools, teachers' attitudes, and curricula should also be reviewed to prevent involvement in a crime.

Substance abuse is one of the sad portraits experienced by many disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions. Substances such as cigarettes, drugs, cannabis, pills, alcohol, bally, cocaine, heroin, and bonsai are used. This question; Pretention to friends, sense of curiosity, high youth unemployment, easy access to substances, cheap substances, limited employment opportunities, presence of substance users in the family, families with many children, low educational level of families, lack of communication within the family, the inadequacy of socio-economic opportunities in individuals appear to be affected by factors such as. In the studies conducted by Toğa (2021), attention is drawn to the existence and intensity of substance use among students in the eastern regions. When they cannot find a substance, it is emphasized that children become involved in crime by stealing. It is already known that there is a relationship between crime and substance use (Holliday, 2017). Likewise, İçli (2016) in his research draws attention to the fact that children who use drugs in metropolitan cities such as Istanbul are predominantly of eastern origin (Aladağ, 2016; Cömert, 2018). In other words, it can be said that this habit is observed more intensely in students whose mother tongue is Kurdish. In the study conducted by Duman and Akosman (2021), it is noted that the transportation of substances is effortless, especially in the province of Van. He states that this situation also increases substance use and addiction. It is especially emphasized that the number of substance use and addiction in Van is alarming. It is also stated that these children often experience problems within the family. All the above discussions understand that early school leaving in bilingual students leads to involvement in crime due to insufficient acquisition of a second language. Therefore, the issue of substance use and addiction can be indirectly associated with this situation.

The last of the sad portraits of many disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions is academic failure. Factors include intensive teacher mobility, inability to acquire basic language skills, not compulsory preschool education, paid to teach, physical inadequacy of schools, Turkish-Kurdish language conflict, reading comprehension

problems, short Turkish vocabulary, lack of teaching materials, crowded classrooms cause academic failure. Understandable. Ultimately, students in this scope fail national and international exams more than their peers in other regions. As a matter of fact, various research results draw attention to the learning losses and academic failures experienced by bilingual students due to the factors mentioned above (Asrağ, 2009; Canpolat, 2011; Emeç, 2011; Gözükuçuk, 2015; Kızıldaş, 2019, 2021; Özdemir & Altıparmak, 2005; Öztepe, 2019; Sönmez, 2006; Turan, 2019; Yılmaz & Şekerci, 2016). In other words, it can be said that the results of this research overlap with the results of many studies in the context of various factors. It was especially emphasized by Asrağ (2009) that the insufficient acquisition of Turkish would lead to chaos in bilingual students, so this situation should be given importance. It is even observed that the communication between teachers and students who cannot learn the second language adequately is sometimes provided with body language (Sincar, 2015). On the other hand, Aslan, Arslantaş, and Aslan (2015) state that the academic success of bilingual students increases by teaching Turkish well, increasing continuity in preschool education, and increasing support from parents. Likewise, Kırmızı, Özcan, and Şencan (2016) state that receiving preschool education in rural areas contributes significantly to improving Turkish language skills. In the study conducted by Coşkun, Derince and Uçarlar (2010), it is understood that bilingual students who do not learn or do not know the second language sufficiently are more unsuccessful academically. Drawing attention to the fact that these students generally repeat the grade, it is emphasized that the biggest reason for this is linguistic. Therefore, it can be said that the development of Turkish language skills in bilingual students will effectively minimize academic failures.

### **Suggestions**

The attendance of disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions should be regularly monitored. The support of non-governmental organizations, headmen, opinion leaders, and institution managers should be sought to bring early school leavers to school. In addition, collaboration with relevant government agencies should be made to minimize the factors that cause this problem.

Administrative and judicial penalties should be applied to parents to marry disadvantaged bilingual students at a young age. In this regard, support units should be established, and the relevant institutions of the state should provide regular school visits.

In order to prevent disadvantaged bilingual students in rural areas from working at a young age, financial support should be given to the family budget at regular intervals. In this context, aids such as stationery and clothing can be added to the support of free textbooks provided to children.

Cooperation with law enforcement and health institutions should be done to prevent disadvantaged bilingual students living in rural areas from getting involved in crime and using drugs. In this context, seminars can be given to families and students by security and health personnel at schools. It is also essential that the people who cause the crime are exposed to deterrent sanctions. Finally, all kinds of support should be provided to children who are dragged into the substance swamp. ÇEMATEM (Child and Adolescent Substance Addiction Treatment Center) and AMATEM (Alcohol-Substance Addiction Research, Treatment and Training Centers) centers should be opened in many provinces of the eastern regions.

In order to minimize the academic failures of disadvantaged bilingual students in rural areas of Turkey's Eastern and Southeastern Anatolian regions, effective Turkish teaching is essential. Preschool education should be made compulsory in order to complete the deficiency in this regard. On the other hand, irregular and unfair assignments within and outside the province should be avoided so that the classrooms are not affected by the constant problem of changing teachers. Particularly at the primary school level, paid teaching should be abolished entirely and immediately. It should be ensured that permanent/contracted teachers stay in regional schools. For this, a well-equipped and satisfactory incentive model should be developed.



Field studies should be conducted on sad portraits representing disadvantaged bilingual students in rural areas of Eastern and Southeastern Anatolian regions of Turkey. On this subject, in-depth research can be done on one or more of the sad portraits by taking the opinions of teachers and parents.

EU, MEB-supported projects can be developed to eliminate the sad portraits of disadvantaged bilingual students in rural areas of Eastern and Southeastern Anatolian regions of Turkey.

The proportion of disadvantaged bilingual students in rural areas with early school leaving and becoming involved in juvenile delinquency should be investigated. In this regard, the problems can be carried to a different dimension, especially by interviewing students in prisons.

## REFERENCES

- Adelman, M., & Székely, M. (2016). *School dropout in central America: An overview of trends, causes, consequences and promising interventions*. Washington.
- Alaca, F. (2011). *İki dilli olan ve olmayan öğrencilerde okul yaşam kalitesi algısı ve okula aidiyet duygusu ilişkisi*. Çukurova Üniversitesi, Adana.
- Aladağ, G. (2016). *Kent, yoksulluk ve göç bağlamında çocuk suçluluğu: Diyarbakır örneği (Published master's thesis)*. Van: Yüzüncü Yıl Üniversitesi.
- Al-Anazi, H. M., & Al-Shamli, A. K. (2011). Sensation seeking and delinquency among Saudi adolescents. *European Journal of Social Sciences*, 21(2), 265-286. Retrieved March 5, 2021 from <https://adhd.org.sa/wp-content/uploads/2016/09/Sensation-seeking-and-delinquency-among-Saudi-adolescents-Al-Anazi-HM-2011.pdf> Retrieved March 1, 2021 from
- Álvares, M., & Estevão, P. (2013). What do we mean by school dropout? Early School Leaving and the shifting of paradigms in school dropout measurement. *The Portuguese Journal of Social Science*, 1-12. [https://doi.org/10.1386/pjss.13.1.21\\_1](https://doi.org/10.1386/pjss.13.1.21_1)
- Amao, I. O., Oni, O. A., Yusuf, S. A., & Omonona, B. T. (2010). Determinants of child labor and schooling in rural northeastern Nigeria. *Journal of Rural Economics and Development*, 19(1), 34-45. <https://doi.org/10.22004/ag.econ.206861>
- Asrağ, A. C. (2009). *İlköğretim birinci kademe öğrencilerinin anadil öğrenim problemleri ve sınıf iklimine etkisi: Türkçe konuşma problemleri Şanlıurfa ili örneği (Published master's thesis)*. Konya.
- Aytekin, V. K., & Yılmaz, C. K. (2015). Mardin-Artuklu ilçesi lise düzeyi okul yöneticilerinin 2015 yılı PISA Türkiye sınav sonuçları ile ilgili görüşleri. *Kadim Akademi SBD*, 2(1), 69-80. Retrieved April 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/486131>
- Biçer, N., & Alan, Y. (2018). İki dillilik bağlamında Suriyeliler üzerinde Türkçenin etkisi. *Yeni Türkiye*, 24(100), 346-352.
- Burcu, E., Yıldırım, F., Sırma, Ç. S., & Sanıyaman, S. (2015). Çiçeklerin kaderi: Türkiye’de kadınların erken evliliği üzerine nitel bir araştırma. *Bilig*, 73, 63-98. Retrieved April 17, 2021 from <https://dergipark.org.tr/tr/download/article-file/234231>
- Canpolat, Ö. (2020). *Ana dili konuşamama-ötekileştirilme-yabancılaşma üçgeninde sıkışmalar: Ortaokul ve lise öğrencilerinin durumları (İstanbul ve Batman’da yapılan karma çalışma, 2019) (Unpublished doctoral dissertation)*. İstanbul.

- Ceyhan, M. A., & Koçbaşı, D. (2011). *Göç ve çok dillilik bağlamında okullarda okuryazarlık edinimi*. İstanbul.
- Chin, A. (2015). Impact of bilingual education on student achievement. *I.Z.A. World of Labor.*, 131, 1-10. <https://doi.org/10.15185/izawol.131>
- CNN Türk. (2018). *Madde bağımlılarının yürek burkan ibretlik hikayeleri*. Retrieved June 10, 2021 from <https://www.cnnturk.com/turkiye/madde-bagimlilarinin-yurek-burkan-ibretlik-hikayeler>
- Coşkun, V., Derince, M. Ş., & Uçarlar, N. (2010). *Dil yarası: Türkiye'de eğitimde anadilinin kullanılmaması sorunu ve Kürt öğrencilerin deneyimleri*. Diyarbakır.
- Cömert, Ö. (2018). *Mükerrer çocuk suçluluğu: Bitlis ili örneği (Published master's thesis)*. Elazığ: Fırat Üniversitesi.
- Çelikten, M., Şanal, M., & Yeni, Y. (2005). Öğretmenlik mesleği ve özellikleri. *Erciyes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 19(2), 207-237. Retrieved March 18, 2021 from <https://dergipark.org.tr/tr/download/article-file/234231>
- Çifci, E. G. (2008). *Kapkaç suçundan hüküm giyenlerin, sosyo-demografik özellikleri, sosyal dışlanma süreçleri, suç ve diğer sapma davranışlar açısından incelenmesi (Unpublished doctoral dissertation)*. Ankara.
- Derince, M. Ş. (2012). *Ana dili temelli çok dilli ve çok diyalektli dinamik eğitim: Kürt öğrencilerin eğitiminde kullanılabilecek modeller*. Diyarbakır.
- Doll, J. J., Eslami, Z., & Walters, L. (2013). Understanding why students drop out of high school, according to their own reports: Are they pushed or pulled, or do they fall out? A comparative analysis of seven nationally representative. *SAGE Open*, 3(4), 1-15. <https://doi.org/10.1177/2158244013503834>.
- Duman, M. Z., & Akosman, B. G. (2021). Madde bağımlısı bireylerin ve çocuğu bağımlı olan ailelerin yaşadığı sorunlar: Van örneği. *Sosyoloji Araştırmaları Dergisi*, 24(2), 166-198. <https://doi.org/10.18490/sosars.927234>
- Durna, T., & Kubilay, Ç. (2010). Basının şiddeti: Siyasal gösterilerde 'polise taş atan çocuklar' örneği. *Ankara Üniversitesi SBF Dergisi*, 65(3), 52-85. [https://doi.org/10.1501/SBFder\\_0000002173](https://doi.org/10.1501/SBFder_0000002173)
- Düzen, N. (2017). *Ana dili Türkçe olan ve olmayan okul öncesi dönem çocuklarının erken okuryazarlık becerilerinin değerlendirilmesi (Published master's thesis)*. Ankara.
- Eğitim Reform Girişimi. (2011). *Eğitim İzleme Raporu*. İstanbul.
- Eğitim-Bir-Sen. (2019). *Öğretmen atama ve yer değiştirme süreci tespitler ve bir model önerisi*. Ankara.
- Ekinci, N. K. (2016). *Suçta sürüklenmiş çocukların annelerinin çocuklarına ilişkin algısı: Siirt örneği (Published master's thesis)*. Ankara.
- Emeç, H. (2011). *Türkçenin yeterince etkin ve güzel konuşulmadığı yerlerde ilkokuma yazma öğretiminde öğretmenlerin karşılaştıkları sorunlar (Erzurum ili örneği) (Published master's thesis)*. Erzurum.
- Emin, M. N. (2019). PISA 2018 sonuçları nasıl okunmalıdır? *SETA Perspektif*, 251, 1-5. Retrieved April 19, 2021 from <https://setav.org/assets/uploads/2019/12/P251.pdf>



- ERG. (2018). *Eğitim İzleme Raporu: Öğrenciler ve eğitime erişim*. İstanbul.
- Erol, M., & Özdemir, F. (2020). Öğretmen adayları için Doğu ve Güneydoğu Anadolu'ya atanma kaygısı ölçeğinin geliştirilmesi. *Ulak Bilge Sosyal Bilimler Dergisi*, 50, 742-753. <https://doi.org/10.7816/ulakbilge-08-50-02>
- Esersin, S. (2017). *Tek dilli Türkçe ve iki dilli Türkçe-Kürtçe konuşan dil bozukluğuna sahip çocukların morfolojik ve sentaktik özelliklerinin incelenmesi*. Eskişehir.
- E.U. Report (2005). *Turkey 2005 progress report*. Retrieved May 15, 2021 from [https://www.ab.gov.tr/files/AB\\_Iliskileri/Tur\\_En\\_Realitons/Progress/Turkey\\_Progress\\_Report\\_2005](https://www.ab.gov.tr/files/AB_Iliskileri/Tur_En_Realitons/Progress/Turkey_Progress_Report_2005).
- Ferdoos, A., & Ashiq, A. (2015). Impact of urbanization on juvenile delinquency: A study of Muzaffaraba Jail. *International Journal of Criminology and Sociological Theory*, 8(1), 1-14. Retrieved April 21, 2021 from <https://ijcst.journals.yorku.ca/index.php/ijcst/article/view/40241/36349>
- Fırat, D. (2015). *Ulus devlet, dil ve kimlik politikaları bağlamında anadili Kürtçe ve Arapça olan öğretmen ve akademisyenlerin anadilinde eğitime ilişkin görüşleri (Published master's thesis)*. Ankara.
- Gazete Gerçek. (2017). *Çocuk gelin'lerle topyekun mücadele*. Retrieved June 07, 2021 from <https://www.gazetegercek.com.tr/cocuk-gelin-lerle-topyekun-mucadele/> 63862/
- Gil, A. J., Antelm-Lanzat, A. N., Cacheiro-González, M. L., & Pérez-Navío, E. (2018). School dropout factors: a teacher and school manager perspective. *Educational Studies*, 1-17. <https://doi.org/10.1080/03055698.2018.1516632>
- Gök, A. (2021). *Aile bireyinin bonzai kullanıp kullanmadığını nasıl anlayabiliriz?* Retrieved June 07, 2021 from <https://www.aligok.com.tr/bonzai-kullanan-nasil-anlasilir-belirtileri-nelerdir/>
- Gökşen, F., Cemalcılar, Z., & Gürlesen, C. F. (2016). *Türkiye'deki ilköğretim okullarında okulu terk ve izlenmesi ile önlenmesine yönelik politikalar*. İstanbul.
- Gözükcük, M., & Kıran, H. (2018). İkinci dili Türkçe olan ilköğretim öğrencileriyle iletişim kurmada karşılaşılan sorunlar ve çözüm önerileri. *Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*(32), 225-236. <https://doi.org/10.30794/pausbed.424365>
- Gün, S. (2017). Toplumsal bir sorun: Sokakta çalışan çocuklar. *Mesleki Sağlık ve Güvenlik Dergisi*, 42-46. Retrieved May 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/821438>
- Haber Türk. (2011). *Taş atan çocuk ailesinden alınacak*. Retrieved June 07, 2021 from <https://www.haberturk.com/yasam/haber/693377-tas-atan-cocuk-ailesinden-alinacak>
- Holliday, S. B. (2017). Family functioning and predictors of runaway behavior among at-risk youth. *Child an Adolescent Social Work Journal*, 247-258.
- Hoşgör, A. G., & Smits, J. (2006). Effects of family background characteristics on educational participation in Turkey. *International Journal of Educational Development*, 26, 545-560. <https://doi.org/10.1016/j.ijedudev.2006.02.002>
- Huang, S. S. (2005). *Education of Kazakh children: A Situation analysis*. Retrieved April 21, 2021 from [https://tbinternet.ohchr.org/Treaties/CERD/Shared%20Documents/MNG/INT\\_CERD\\_NGO\\_MNG\\_69\\_9704\\_E.pdf](https://tbinternet.ohchr.org/Treaties/CERD/Shared%20Documents/MNG/INT_CERD_NGO_MNG_69_9704_E.pdf)

- Hunt, F. (2008). *Dropping out from school: A cross country review of literature*. Birleşik Krallık.
- I.L.O. (2004). *Child Labour. A textbook for university students*. Geneva.
- İçli, T. G. (2016). Türkiye'de suçlular: Sosyal, kültürel ve ekonomik özellikleri. *Ankara, Atatürk Kültür Merkezi Yayını*.
- İlke Haber Ajansı. (2011). *Bali çeken çocuklar halkı tedirgin ediyor*. Retrieved June 07, 2021 from <http://www.ilkehaberajansi.com.tr/haber/bali-ceken-cocuklar-halki-tedirgin-ediyor.html>
- İnal, K. (2020). Türkiye'de Kürtçe konuşan insan olmak-Bir yaşam alanı olarak Türkçe. *Eğitim Bilim Toplum Dergisi*, 17(67), 89-121.
- Kaptanoğlu, İ. Y., & Ergöçmen, B. (2012). Çocuk gelin olmaya giden yol. *Sosyoloji Araştırmaları Dergisi*, 15, 130-161. Retrieved May 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/117693>
- Karacelil, S. (2013). Terör-din eğitimi ilişkisi: Taş atan çocukların dinî alt yapıları ve dine bakış açıları. *SDÜ Fen Edebiyat Fakültesi Sosyal Bilimler Dergisi*, 28, 17-41. Retrieved May 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/117799>
- Kartal, S., & Ballı, F. E. (2020). Okul terki araştırmaları:Sistemik bir analiz çalışması. *Kırıkkale Üniversitesi Sosyal Bilimler Dergisi*, 10(2), 257-278. Retrieved May 18, 2021 from <https://dergipark.org.tr/tr/pub/kusbd/issue/56190/615994>
- Kırmızı, F. S., Boztaş, H., Salgut, E., Adıgüzel, D., & Koç, A. (2019). Ana dili Türkçe olmayan öğrencilerde okul öncesi eğitimin ilk okuma yazma sürecine etkisi. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*. 48, 105-129. <https://doi.org/10.9779/pauefd.509817>
- Kırmızı, F. S., Özcan, E., & Şencan, D. (2016). Türkçenin az konuşulduğu bölgelerde ilk okuma yazma sürecinde karşılaşılan sorunlara ilişkin öğretmen görüşleri. *Uluslararası Türkçe Edebiyat Kültür Eğitim Dergisi*, 5(1), 412-445. <https://doi.org/10.7884/teke.555>
- Kızıldaş, Y. (2019). Ana dili farklı ilköğretim öğrencilerinin akıcı okuma ve okuduğunu anlama becerilerinin incelenmesi. (*Unpublished doctoral thesis*). Ankara: Gazi Üniversitesi.
- Kızıldaş, Y. (2021). İki dilli öğrencilerin ikinci dil ediniminde etkili olan faktörler ve dezavantajlı gruplara dönüşmeleri: Kuramsal ve derleme bir çalışma. *Trakya Eğitim Dergisi*. 11(2), 1021-136. <https://doi.org/10.24315/tred.775100>
- Kozikoğlu, İ., & Senemoğlu, N. (2018). Mesleğe yeni başlayan öğretmenlerin karşılaştıkları güçlükler: Nitel bir çözümleme. *Eğitimde Nitel Araştırmalar Dergisi - ENAD*, 6(3), 341-371. <https://doi.org/10.14689/issn.2148-2624.1.6c3s16m>
- Köseli, A., & Çelik, K. (2020). *Çocuk yaşta, erken ve zorla evliliklerin sağlık riskleri ve sonuçlarına çok sektörlü yaklaşım*. Ankara.
- Kulaksız, Y. (2008). *Türkiye'de bölgesel gelişmişlik farkları, istihdam ve kurum hizmetlerinin çeşitlendirilmesi*. Ankara.
- Kurban, D., & Yolaçan, S. (2008). *Kürt sorununun çözümüne dair bir yol haritası: Bölgeden hükümete öneriler*. İstanbul.
- Küçüker, E. (2018). Üç öykü üzerinden 'okul terki':Eğitimsizlik, yoksulluk ve ataerkillik. *Eğitim Bilim Toplum*, 16(64), 94-119.

- Liu, F. (2014). Basic education in China's rural areas: a legal obligation or an individual choice? *International Journal of Educational Development*, 24, 5-21. <http://dx.doi.org/10.1016/j.ijedudev.2003.09.001>
- Malatyali, M. K. (2014). Türkiye'de çocuk gelin sorunu. *Nesne Psikoloji Dergisi*, 3, 27-38. Retrieved May 21, 2021 from <https://www.nesnedergisi.com/makale/pdf/1398191949.pdf>
- MEB. (2019). *PISA 2018 Türkiyem ön raporu*. Ankara.
- MEB. (2020). *TIMSS 2019 Türkiye ön raporu*. Ankara.
- Mevsimlik Gezici Tarım İşçiliği Araştırma Raporu (MGTİAR). (2014, 09 17). *Hayata Destek Derneği*. Retrieved May 21, 2021 from <https://www.hayatadestek.org/wp-content/uploads/2014/12/mevsimlik-gezici-tarim-isciligi-2014-arastirma-raporu.pdf>
- Mokibelo, E. B. (2014). Why we drop out of school: Voices of san school dropouts in Botswana. *The Australian Journal of Indigenous Education*, 43(2), 185-194. <https://doi.org/10.1017/jie.2014.26>
- Mothibi, K. (2014). Substance abuse amongst high school learners in rural communities. *Universal Journal of Psychology*, 2(6), 181-191. <https://doi.org/10.13189/ujp.2014.020601>
- Nikolaou, S. M., Papa, M., & Gogou, L. (2018). Early school leaving in Greece and Europe and educational inequality: Actions and policies against educational and social exclusion. *European Journal of Social Science Education and Research*, 5(1), 212-220. <https://doi.org/10.26417/ejser.v5i1.p212-220>
- Ntelele Mohlouoa, M. M. (2014). *Factors influencing the dropout rate in primary schools in the Teyateyaneng region, Lesotho*. South Africa.
- O.E.C.D. (2020). *The impact of COVID-19 on student equity and inclusion: Supporting vulnerable students during school closures and school re-openings*. Retrieved May 17, 2021 from [https://read.oecd-ilibrary.org/view/?ref=434\\_434914-59wd7ekj29&title=The-impact-of-COVID-19-on-student-equity-and-inclusion](https://read.oecd-ilibrary.org/view/?ref=434_434914-59wd7ekj29&title=The-impact-of-COVID-19-on-student-equity-and-inclusion)
- Oktay, H. (2012). *Türkiye'de öğretmen istihdamında yaşanan sorunlar (Published master's thesis)*. İzmir.
- Orcan, M., & Kar, M. (2008). Türkiye'de erken yaşta yapılan evlilikler ve risk algısı. *Aile ve Toplum*, 10(4), 97-112. Retrieved May 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/198101>
- Öğülmüş, S., Aypay, A., Taşpınar, M., Kaya, N. Ç., Varçın, R., Pişkin, M., . . . Çam, Z. (2013). *Ortaöğretimde sınıf tekrarı, okul terk etme sebepleri ve örgün eğitim dışında kalan çocuklar politika önerileri raporu*. Ankara.
- Özdemir, H. (2016). *Ortaokul beşinci sınıfta okuyan iki dilli öğrencilerin yazma becerilerinin değerlendirilmesi (Published master's thesis)*. Van.
- Özdemir, A. İ. ve Altıparmak, A. (2005). Sosyo-ekonomik göstergeler açısından illerin gelişmişlik düzeyinin karşılaştırmalı analizi. *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 24, 97-110.
- Özdemir, S., Erkan, S., Karip, E., Sezgin, F., & Şirin, H. (2010). *İlköğretim okulu öğrencilerinin okulu terk etme nedenleri ve çözüm önerileri*. Ankara.

- Özdemir, S., Şirin, H., & Sezgin, F. (2009). Okulu terk eden çocukların ve velilerinin okul terkine ilişkin görüşleri: Nitel bir inceleme. *Ege Üniversitesi. İzmir*.
- Özen, Ş., Aydın, E., Oto, R., Tıraşçı, Y., & Gören, S. (2005). Juvenile delinquency in a developing country: A province example in Turkey. *International Journal of Law and Psychiatry*, 28, 430-441. <https://doi.org/10.1016/j.ijlp.2004.05.001>
- Özgür Kocaeli. (2020). *Mendil satan çocuktan mendil almayın*. Retrieved June 06, 2021 from <https://www.ozgurkocaeli.com.tr/haber/4509455/mendil-satan-cocuktan-mendil-almayin>
- Özoğlu, M. (2011). Türkiye'nin öğretmen yetiştirme politikası. *21. Yüzyılda Türkiye'nin Eğitim ve Bilim Politikaları Sempozyumu* (s. 143-156). Ankara.
- Öztepe, D. (2019). *Ana dili farklı ilkokul öğrencilerine Türkçe ilkokuma ve yazma öğretiminde karşılaşılan güçlüklerle ilişkin öğretmen görüşlerinin incelenmesi (Published master's thesis)*. Trabzon.
- Pekgenç, Y. (2019). *Sınıf öğretmenlerinin iki dilli sınıflarda yaşadığı eğitsel ve iletişimsel sorunlara ilişkin görüşleri*. Diyarbakır.
- Podešvová, B. (2017). *Education of children in rural areas of developing country*. Çekya.
- Raselekoane, N. R., Mulaudzi, T. P., Thobejane, T. D., & Baloyi, H. (2019). The unfurling juvenile delinquency in South African rural areas: The case of Abel village in Greater Tzaneen Municipality, Limpopo province . *Ubuntu: Journal of Conflict and Social Transformation*. 155-172 . <https://doi.org/10.31920/2050-4950/2019/sin2a9>
- Rathinabalan, I., & Naaraayan, S. A. (2017). Effect of family factors on juvenile delinquency. *International Journal of Contemporary Pediatrics*, 4(6), 2079-2082. <http://dx.doi.org/10.18203/2349-3291.ijcp20174735>
- Rodriguez, D., Carrasquillo, A., Garcia, E., & Howitt, D. (2020). Factors that challenge English learners and increase their dropout rates: recommendations from the field. *International Journal of Bilingual Education and Bilingualism*, 1-17. <https://doi.org/10.1080/13670050.2020.1722059>.
- Rumbaut, R. G. (1995). The new immigration. *Contemporary sociology*, 24(4), 307–311.
- Rumberger, R. (2011). Why students drop out of school and what can be done. *Dropouts in America: How severe is the problem? What Do we know about intervention and prevention?* (s. 1-104). Cambridge.
- Sabancı Vakfı. (2015). *Van'da çocuk evlilikleri ile mücadele*. 3. Retrieved June 08, 2021 from <https://www.sabancivakfi.org/tr/sosyal-degisim/van-da-cocuk-evlilikleri-ile-mucadele>
- Sakuta, T. (1995). Social factors leading to juvenile delinquency. *J-STAGE*, 287-295. <https://doi.org/10.2302/kjm.45.287>
- Sarı, M. (2000). *İki dilli çocukların çözümleme yöntemiyle okuma-yazma öğrenirken karşılaştığı güçlükler*. Adana.
- Sarier, Y. (2010). Ortaöğretime giriş sınavları (OKS-SBS) ve PISA sonuçları ışığında eğitimde fırsat eşitliğinin değerlendirilmesi. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi*, 11(3), 107-129. Retrieved May 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/1492908>
- Shafique, M. (2013). *Why do students Drop out?* . Nangarhar.

- Shannon, G. S., & Bylsma, P. (2016). *Helping students finish school. Why students drop out and how to help them graduate*. Olympia, WA.
- Sincar, F. (2015). *Anadili eğitim dilinden farklı olan öğrencilerin karşılaştıkları sorunlara ilişkin bir araştırma ((Published master's thesis)*. Gaziantep.
- Slomkowski, C., Rende, R., Conger, K. J., Simons, R. L., & Conger, R. D. (2001). Sisters, brothers, and delinquency valuating social influence during early and middle adolescence. *Child Development*, 72, 271-283. <https://doi.org/10.1111/1467-8624.00278>
- Smith, C. A., Stone, R. P., & Kahando, 2. (2012). A model of women's educational factors related to delaying girls' marriage. *International Review of Education*. DOI 10.1007/s11159-012-9309-1, 58, 533-555. <https://doi.org/10.1007/s11159-012-9309-1>
- Smits, J. & Hoşgör, A. G. (2006) Effects of Family Background Characteristics on Educational Participation in Turkey. *International Journal of Educational Development*. 26, 545-560.
- Sönmez A. S. (2006). *Güneydoğu Anadolu bölgesinde eğitimin fırsat eşitliği açısından değerlendirilmesi. (Published master's thesis)*. Dicle Üniversitesi, Diyarbakır.
- Sözcü. (2015). *Polise taş atan çocuklar tutuklandı*. Retrieved June 09, 2021 from <https://www.sozcu.com.tr/2015/gundem/polise-tas-atan-cocuklar-tutuklandi-1014523/>
- Sözer, H. (2020). Bir çocuk istismarı formu olarak çocuk evlilikleri:Kültüre sığınmanın yolları. *Sosyoloji Araştırmaları Dergisi*, 23, 157-191. <https://doi.org/10.18490/sosars.728332>
- Su, F. Y. (2020). *Okul öncesi eğitime iki dilliliğin yansımaları: Etnografik bir durum çalışması*. Kahramanmaraş.
- Subrahmanyam, G. (2016). *Gender perspectives on causes and effects of school dropouts*. Stockholm.
- Şahin, H. (2018). Toplumsal değişim aracı olarak eğitim ve Güneydoğu Anadolu Bölgesi'nde eğitimde eşitsizlik. *Akademik Sosyal Araştırmalar Dergisi*, 6(74), 414-431. <https://doi.org/10.16992/ASOS.13842>
- Şehrivan Gazetesi. (2020). *Van çocuk gelin sıralamasında 5'nci oldu!* Retrieved June 07, 2021 from <https://www.sehrivangazetesi.com/genel/van-cocuk-gelin-siralamasinda-5nci-oldu-h71708.html>
- Şimşek, H. (2011). Lise öğrencilerinde okulu bırakma eğilimi ve nedenleri (Güneydoğu Anadolu bölgesi örneği). *Eğitim Bilimleri Araştırmaları Dergisi*, 1(2), 27-47. Retrieved May 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/696391>
- Şimşek, H., & Şahin. (2012). İlköğretim ikinci kademe öğrencilerinde okulu bırakma eğilimi ve nedenleri. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi*. Retrieved May 17, 2021 from <https://dergipark.org.tr/tr/download/article-file/16555>
- Şimşek, H., & Şimşek, A. S. (2013). Güneydoğu Anadolu bölgesi lise öğrencilerinde sosyal bütünleşme düzeyi. *Milli Eğitim Dergisi*, 198, 73-96. <https://dergipark.org.tr/tr/download/article-file/442206>
- Taşkaya, S. M., Turhan, M., & Yetkin, R. (2015). Kırsal kesimde görev yapan sınıf öğretmenlerinin sorunları. *Uluslararası Sosyal Bilimler Dergisi*, 6(18), 198-210. Retrieved May 15, 2021 from [http://www.ijoess.com/Makaleler/347865877\\_198-210%20serdarhan%20musa%20ta%c5%9fkaya.pdf](http://www.ijoess.com/Makaleler/347865877_198-210%20serdarhan%20musa%20ta%c5%9fkaya.pdf)

- TESEV (Türkiye Ekonomik ve Sosyal Etüdler Vakfı). (2008). *Kürt sorununun çözümüne dair bir yol haritası: Bölgeden hükümete öneriler*. İstanbul: Myra.
- The European Monitoring Centre for Drugs and Drug Addiction (E.M.C.D.D.A.). (2014). *2014 National report (2013 data) to the E.M.C.D.D.A. by the reitox national focal point. Turkey new development, trends and in-depth information on selected issues*. Lizbon.
- Toğa, H. (2021). *Aile ilişkilerinin çocuk suçluluğu üzerindeki etkileri: Doğu Anadolu bölgesi (Published master's thesis)*. Yalova: Yalova Üniversitesi.
- Tomanbay, İ. (2016). *Madde bağımlılığı ve sosyal hizmet*. İstanbul.
- Tuğrul, Y. (2018). Erken yaşta evlendirilen kadınların evlilik süreçleri, deneyimleri ve sonraki yaşamları üzerine nitel bir çalışma. *Sosyoloji Notları*, 2(1), 1-37. <https://dergipark.org.tr/tr/download/article-file/494437>.
- Tulu, Y. (2009). *Ana dili Türkçe olan ve ana dili Türkçe olmayan (iki dilli) 4-7 yaş çocukların dil düzeylerine etki eden faktörlerin incelenmesi*. Konya.
- Turan, A. V. (2019). *Öğretmen görüşlerine göre ana dili Türkçe olmayan ortaokul öğrencilerinin Türkçe derslerinde yaşadığı sorunlar ve çözüm önerileri (Published master's thesis)*. Giresun.
- Uğur, N. (2017). *Ana dili eğitim dilinden farklı olan öğrenci ve velilerin yaşadıkları sorunların çözümü*. Ankara.
- UNESCO. (2015). *Education for All, 2000-2015: achievements and challenges-Education for all global monitoring report 2015*. Paris.
- UNFPA. (2020). *Çocuk yaşta, erken ve zorla evliliklerin sağlık riskleri ve sonuçlarına çok sektörlü yaklaşım*. Odak Ofset : Ankara.
- UNICEF. (2011). *Türkiye'de çocukların durumu raporu*. Brüksel.
- Urfa Haber 63. (2016). *Çocuklar okul yerine tarlada*. Retrieved June 07, 2021 from <https://www.urfahaber63.com/cocuklar-okul-yerine-tarlada/8710/>
- Urfa Haber 63. (2017). *Kırmızı ışıktaki cam silen çocuk işçiler*. Retrieved June 05, 2021 from <https://www.urfahaber63.com/kirmizi-iskta-cam-silen-cocuk-isciler/10510/>
- Uslu, Z. (2007). Dil edinimi ve yabancı dil öğreniminde yaş faktörünün rolü. *D.Ü.Ziya Gökalp Eğitim Fakültesi Dergisi*, 8, 146-156. Retrieved May 19, 2021 from <https://dergipark.org.tr/tr/download/article-file/787226>
- Uygun, S. (2013). *Türk eğitim sistemi sorunları*. Ankara.
- Uysal, M. T., Eren, G. T., & Şimşek, E. (2019). Sosyo-kültürel özellikler bağlamında erken evlilikler: Ağrı örneği. *Mediterranean Journal of Humanities*. IX(1), 349-375. <https://doi.org/10.13114/MJH.2019.468>

- Yalçın, D. (2017). Ücretli öğretmenlik uygulamasının öğrencilerin matematik dersine karşı tutumuna etkisinin incelenmesi. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi*, 3(1), 1-11. Retrieved May 16, 2021 from <https://dergipark.org.tr/tr/download/article-file/300643>
- Yaman, Ö. M., & Yılkan, İ. (2019). Kömür çocuklar: Çocuk işçiliğinin farklı bir görünümü Patnos örneği. *Bingöl Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 9(17), 235-252. <https://doi.org/10.29029/busbed.489734>
- Yardımcı, Ş. (2018). *Çocuk suçluluğu üzerine sosyolojik bir araştırma: Van kent merkezi örneği (Published master's thesis)*. Van: Yüzüncü Yıl Üniversitesi.
- Yaşan, F., & Gürgen, A. (2014). Güneydoğu Anadolu bölgesinde ergenlerde uçuşu madde kullanım özellikleri. *Bağımlılık Dergisi*, 5(2), 28-34.
- Yazıcı, Z., & Temel, Z. F. (2012). İki dilli ve tek dilli çocuklarda dil gelişimi okuma olgunluğu ilişkisi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, 1(22), 145-158. Retrieved May 15, 2021 from <https://dergipark.org.tr/tr/download/article-file/181345>
- Yeni Şafak. (2010). *Taş atan çocuklarla toplu barış* Retrieved June 09, 2021 from <https://www.yenisafak.com/gundem/tas-atan-cocuklarla-toplu-baris-251451>
- Yılmaz, F., & Şekerci, H. (2016). Ana dil sorunsalı: Sınıf öğretmenlerinin deneyimlerine göre ilköğrencilerinin yaşadıkları sorunlar. *Eğitimde Nitel Araştırmalar Dergisi - ENAD*, 4(1), 47-63. <http://dx.doi.org/10.14689/issn.2148-2624.1.4c1s3m>
- Yılmaz, M. (2017). *Giresun ili fındık işletmelerinde çocuk işçiliği (Published master's thesis)*. Antalya.
- Yılmaz, N. (2016). *Kürtçe-Türkçe konuşan iki dilli yetişkin bireylerin sözel akıcılık becerilerinin incelenmesi (Published master's thesis)*. Eskişehir.
- Yokozeki, Y. (1996). *The causes, processes and consequences of student dropout from junior secondary school (J.S.S.) in Ghana: the case of Komenda-Edina-Eguafo-Abrem (K.E.E.A.) district*. London.
- Zeyneloğlu, S., Civelek, H. Y., & Coşkun, Y. (2011). Kürt sorununda antropolojik ve demografik boyut: Sayım ve araştırma verilerinden elde edilen bulgular. *Uluslararası İnsan Bilimleri Dergisi*, 8(1), 336-384.

## Developing a Culture-Adapted Mindfulness Stress Reduction Program\*

**Halil İbrahim Özok<sup>i</sup>**

Van Yuzuncu Yıl University

**Fuat Tanhan<sup>ii</sup>**

Van Yuzuncu Yıl University

### Abstract

Stress is part of survival as a driving force, but excessive stress can cause mental and physical harm. According on the circumstances and time of time, stress manifests itself in various ways and causes a variety of symptoms. In this context, numerous sorts of studies on stress and coping mechanisms have been conducted since people's methods of dealing with stress vary from one individual to the next and from one culture to another. This study, which uses empirical research, looks at the outcomes of a stress-reduction program developed using mindfulness principles that have been culturally adjusted. This program has been tested on the level of life satisfaction, mindfulness, and stress levels of individuals. The program was called as the “Culture-Adapted Mindfulness Stress Reduction Program” (CAMSR). In this study, 2x3 experimental model was used with the pre-test, post-test, follow-up test, and control-experimental groups. As a result of the analyzes, it can be said that culture-adapted stress reduction program has shown significant differences between the groups (control and experimental groups) in terms of three variables. The results show that CAMSR has a positive and lasting impact on each of the three factors.

**Keywords:** Mindfulness, Culture-adapted, Stress, Program.

**DOI:** 10.29329/ijpe.2023.534.5

**Submitted:** 07/08/2022

**Accepted:** 27/02/2023

**Published:** 01/04/2023

-----  
\* This study was produced from the first author's PhD thesis.

<sup>i</sup> **Halil İbrahim Özok**, Assist. Prof. Dr., Educational Sciences, Van Yüzüncü Yıl University, ORCID: 0000-0002-6427-6335

**Correspondence:** haliliozok@yyu.edu.tr

<sup>ii</sup> **Fuat Tanhan**, Prof. Dr., Educational Sciences, Van Yuzuncu Yıl University, ORCID: 0000-0002-1990-4988



## INTRODUCTION

We are witnessing a period in which there are scientific, social, and technological rapid changes that have not been seen in any period of history. Adapting to this rapid change can become an important source of stress on individuals. Nowadays, the predictability of the speed and direction of change is almost disappeared, in literature there are many studies showing that individuals experience intense anxiety and stress depending on this situation (Bohlmeijer, 2010). The anxiety that has arisen, makes it difficult for people to adapt and stay in balance (Selye, 1955). In this respect, it is very important to support the students with different psychological support programs in the university environment where there is intense anxiety and stress.

This anxiety and stress experienced intensively during the university period affects human life in many ways such as heart disease, chronic pain, mental disorders, coronary heart disease, cardiovascular diseases, cancer and depressive symptomatology (Llyold-Jones et al, 1999; McElnay and McCallion, 1998; Blyth et al, 2001; Catala et al, 2002; Verdurmen et al, 2006; Ormel et al, 2007; Massie and Popkin, 1998; Ciaramella and Poli, 2001; Patten, 2001). This also affects daily life comfort such as excessive burnout, chronic pain, recurrent diseases, insomnia, loss of concentration and distraction (Alonso et al., 2007). In addition, basic life stressors such as losing relatives, divorce, illness, injury, marriage, job changing, retirement, pregnancy and financial changes disrupt the physical, mental, emotional and mental balance of the human body. Recently, experts have suggested that even routine and secondary stressors, such as telephone calls, loud voices and intensive programs, cause stressful effects and cumulative results (Frey, 1999).

“Mindfulness Based Stress Reduction” (MBSR) is the leading of these programs. The concept of mindfulness was used by Kabat-Zinn to focus on the moment without judgments and to be conscious of the moment in the moment (Kabat-Zinn, 2005; Rosenszweig et al., 2007). Mindfulness leads to a positive increase in health outcomes. For example, Kabat-Zinn reported that he decreased the levels of pain, body perception, medical symptoms, mood, somatization, anxiety, depression, and self-esteem (Kabat-Zinn et al., 1985). Other studies have also shown that people help to cope with many problems; chronic pain, burnout, stress reduction, some types of cancer, heart attack, type 2 diabetes, psoriasis, insomnia, such as (Kabat-Zinn, 1982; Reichers et al., 1997; Chang et al., 2004; Smith et al., 2005; Rosenzweig et al., 2007).

In this study, the preparation and evaluation of a program has been taken as a basis. This program is named as Culture-Adapted Mindfulness Stress Reduction Program (CAMSR) based on the mindfulness theory of which the origin is based on east but more widely and scientifically used on the west, and also which includes the techniques of the elements in our culture. It is thought that students develop learning styles in accordance with the society they live in and a more effective way can be followed with a program to be prepared in this way. Therefore, it was thought that it would be more effective to include elements that include techniques and learning models in accordance with Islamic understanding and Turkish culture, not only based on mindfulness. The aim of this study was to investigate the effects of (CAMSR) on the Life Satisfaction, Minfulness and Stress levels of university students. In order to demonstrate the effectiveness of the program in accordance with these objectives, the following hypotheses are presented: 1) CAMSR increases the level of mindfulness of students and this increase is prolonged. 2) CAMSR increases students' life satisfaction levels and this increase is prolonged. 3) CAMSR declines students' stress levels, and this decline is long-term.

## METHOD

In this study, 2x3 experimental model was used with the pre-test, post-test, follow-up test, and control-experimental groups. Within this method, the first factor means process groups (an experiment, a control); the second factor is the measurement of the dependent variables (pre-test, post-test, follow-up test). While CAMSR was applied to the experimental group, different activities related to stress were applied and the placebo effect was measured. In the study, the Culture Responsive

Stress Program was an independent variable; students' life satisfaction, mindfulness and stress levels were included in the model as dependent variables.

### Study Group

The study group consisted of first and second grade students at Ercis Vocational School in Van Yuzuncu Yil University. Three measures were applied to the students as pre-test and three criteria were determined for participation in the research. Volunteers were selected from the participants whose 1) mindfulness levels were low, 2) life satisfaction levels were low and 3) stress levels were high. These students were randomly assigned to the control and experimental groups of the study. 331 students from seven different departments participated in the pre-test. 165 of these students are female and 166 are male students. And the students meeting these criteria were selected to control and experimental groups which each group had 20 students.

### Data Collection Tools

The following scales were applied to test both hypotheses and the program's efficacy. All scales used in the study were selected in accordance with the participants of the study group. And also, "The Personal Information Form" was used to obtain detailed information about the students.

1. "*Mindful Attention Awareness Scale*" (MAAS), developed by Brown and Ryan (2003), is a 15-item scale that aims to measure the general tendency of being aware of daily experiences. This scale also measures the attention of instant experiences of individuals in daily routine. The scale has a single factor structure. The factor loads of the items vary between .27 and .78 levels. Confirmatory factor analysis showed the fit indices like that ( $\chi^2 / df$ ) = 189.57 / 90, GFI: .92, CFI: .91, RMSEA: .058). These fit indices mean this single factor structure could be used. The internal consistency coefficient of the scale is .82. Total correlations of the items obtained from the scale varied between .25 and .72.

2. "*Satisfaction with Life Scale*" (SWLS), was developed by Diener, Emmons, Larsen and Griffin in 1985. This scale was applied and adapted to Turkish culture by Dağlı and Baysal in 2016. There are five items on the scale. For the entire scale, the consistency coefficient was determined to be  $r = 0.88$ . The scale exhibits a good level of internal consistency, per the results. The CFA-calculated ( $\chi^2 / df$ ) ratio is 1.17 and this value shows that the proposed factor model fits well with the data. Test-retest reliability for the scale was 0.97 and its internal consistency coefficient was 0.88.

3. "*Perceived Stress Scale*" (PSS), was created in 1983 by Cohen, Kamarck, and Mermelste, and its Cronbach Alpha score was 0.86. In 2007, Bilge, Öğce, Genç, and Oran translated the scale into Turkish, and they discovered that the scale's Cronbach's alpha value was 0.81. The scale yields a final score that ranges from 0 to 32.

### Data Collection Process

The study was carried out after the necessary permissions. The students, in the first and second classes of the Vocational School took part in pre-test application on a voluntary basis. The data obtained after the pre-test were analyzed at SPSS program. 40 students, whose low mindfulness and life satisfaction scores and high stress scores, were selected on a voluntary basis. Twenty of these students were randomly assigned to the experimental group and 20 to the control group.

Following the appointment of the experimental and control groups, a suitable environment was arranged and the implementation of the program was started. CAMSR is designed as 8 sessions considering the results of the applications in the literature. The first of these sessions includes the meeting session and the last session is organized as a re-session of termination and techniques. The average session time varies between 1 and 1.5 hours depending on the content of the session. At the end of the program, the post-test was applied to the study group. The data obtained from the post-test

application were analyzed and the difference between post-test and pre-test were examined. Follow-up test was performed approximately 2 months after the post-test. The data obtained from the pre-test, post-test and follow-up test applications were transferred to SPSS program and appropriate analyzes were performed to measure the effectiveness and permanence of the program.

### Data analysis

Pre-test, post-test, and follow-up measurement scores were analyzed by ANOVA. The significance level for the measurements was taken as .05. There wasn't any significant difference between the groups according to the pre-test. We will see this at t-test results. Arithmetic averages were taken for the selection of the students to be included in the program. To regulate data, extreme values were not included in the analysis. Descriptive statistics were given, and the characteristics of the study group were given in findings section. Two-factor variance analysis was used to compare the pre-test, post-test, and follow-up test results between the experimental and control groups. Bonferonni test was used to compare the mean of pre-test, post-test and follow-up test scores of the scales. The error margin was accepted as .05.

## FINDINGS

### Findings about CAMSR

To determine the effectiveness of CAMSR on mindfulness, life satisfaction and stress levels in terms of the above hypotheses, the mean scores of the experimental and control groups after the pre-test were given in the following tables. In the first table, the averages of mindfulness scores are given according to the groups. In the next two tables, the mean of life satisfaction and stress levels according to the groups is given respectively.

**Table 1.** T-test Results of MAAS by groups

Group	N	$\bar{x}$	Ss	Sd	t	p
Exp.	20	39,85	4,83708	38	,800	,429
Con.	20	38,75	3,7957			

**Table 2.** T-test Results of SWLS by groups

Group	N	$\bar{x}$	Ss	Sd	t	p
Exp.	20	9,95	3,51650	38	1,255	,217
Con.	20	8,70	2,73573			

**Table 3.** T-test results of PSS by groups

Group	N	$\bar{x}$	Ss	Sd	t	p
Exp.	20	23,70	2,27342	38	,322	,749
Con.	20	23,45	2,62528			

Considering the above three tables, the participants were distributed to the groups in accordance with the taken criteria. According to these results it can be said that conducting this application with these groups is suitable for this study.

### Findings Related to Mindfulness

This section consists of the results of three applications, ANOVA test results and Bonferroni test results of MAAS. At first, the mean and standard deviations of experimental and control groups according to three tests are given in the following table.

**Table 4.** The Mean and Standard Deviation Values of MAAS

Groups	N	Pre-Test		n	Post-Test		n	Follow up Test	
		$\bar{x}$	Ss		$\bar{x}$	Ss		$\bar{x}$	Ss
Exp.	20	39,85	4,83708	20	76,10	3,76829	20	72,60	4,21026
Control	20	38,75	3,79577	20	40,45	4,47772	20	40,55	4,66200

In this table, the mean of the experimental group participants' scores from the MAAS before the CAMSR was  $\bar{x} = 39.85$ , but after the implementation it increased to  $\bar{x} = 76.10$ . The mean of the control group in the pre-test was  $\bar{x} = 38.75$  and the mean of the post-test was found  $\bar{x} = 40.45$ . Accordingly, there is an increase in the level of mindfulness of the experimental group participants. In the pre-test, post-test, and follow-up tests of the experimental, the scores obtained from the MAAS increased and this increase is permanent despite of a little of decrease. To determine the significance of the differences between the scores of control groups in terms of three tests, the ANOVA results for the repeated measurements are given in the following table.

**Table 5.** ANOVA Results of MAAS Measurements

Source of Variance	SS	Sd	SM	F	p
<b>Between groups</b>	<b>17273,7</b>	<b>39</b>			
Group (Exp/Control)	15778,133	1	15778,133	400,898	.000
Error	1495,567	38	39,357		
<b>Within Groups</b>	<b>16656,667</b>	<b>56</b>			
Measure	8818,217	2	4409,108	537,667	.000
<b>Group*Measure</b>	<b>7215,217</b>	<b>2</b>	<b>3607,608</b>	<b>439,929</b>	<b>.000</b>
Error	623,233	76	8,200		
<b>Total</b>	<b>33930,367</b>	<b>95</b>			

When we look at the table, it was observed that the group effect was significant ( $F(1-38) = 400,898$ ;  $p < .05$ ) in the repeated tests for means of MAAS. This indicates that there is a considerable disparity between the two groups' mean scores. Besides, it was found that the difference between the mean scores of the participants in all three measurements is significant ( $F(2-76) = 537,667$ ;  $p < .05$ ). Accordingly, it can be said that the levels of mindfulness of the participants of the experimental group were changed as a result of the experimental procedure.

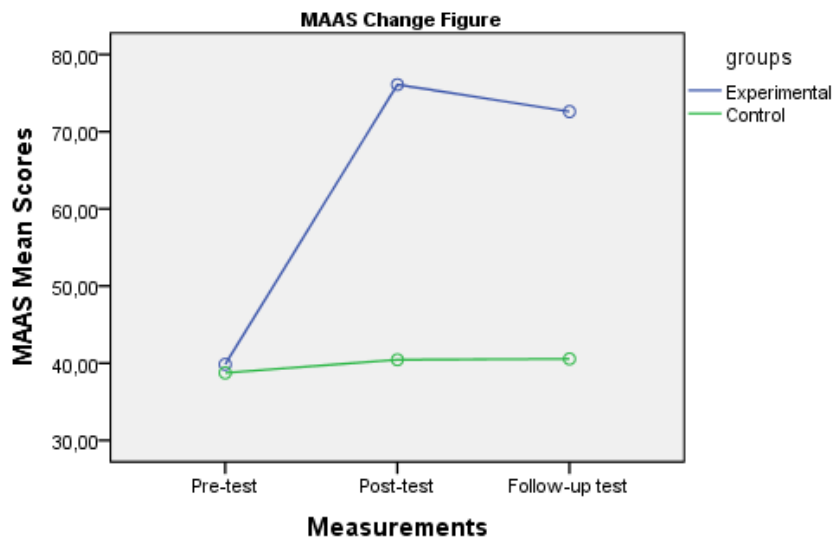
Considering the findings given in the above tables, it can be said that the first hypothesis proposed in this study was confirmed. According to the results obtained from the analysis, there is a significant difference between the experimental and control groups depending on the measurements. The results obtained from the analysis of variance show a significant difference between the groups depending on the measurements. In the analysis of variance, the difference between the groups is determined by the post-hoc test statistics which group is the source of this difference (Kayri, 2009). To find out the source of meaningful difference in measurement \* group interaction in three measurements related to Mindfulness, pair-wise comparisons were made with Bonferroni method. The paired comparison results for the experimental and control groups are given in the table below.

**Table 6.** Post-Hoc Table of MAAS

		Experimental			Control		
		Pre-test	Post-test	Follow-up	Pre-test	Post-test	Follow-up
Experimental	Pre-test	—	-36,250*	-32,750*	1,100		
	Post-test		—	3,500*		35,650*	
	Follow-up			—			32,050*
Control	Pre-test				—	-1,700	-1,800
	Post-test					—	-,100
	Follow-up						—

\* $p < .05$

When the table is examined, the difference between the mean scores of MAAS' pre-test and the post-test of the experimental group participants is meaningfully significant ( $-36,250$ ;  $p < .05$ ). According to this result, it can be said that the experimental process significantly increased the mindfulness levels of the experimental group participants. Additionally, it was noted that the experimental group participants' mean scores in the follow-up test showed a significant difference ( $-32,750$ ;  $p < .05$ ). On the other hand, there was no discernible difference in the control group participants' mean pre-test, post-test, and follow-up test scores ( $F = -1,700$ ;  $p < .05$ ). According to these results, it can be said that mindfulness raising practices show their effect on the process and this effect is persistence. This change can be easily seen in the following figure.



**Figure 1.** Change of Mindfulness Scores Depending on Groups and Measurements

As seen in Figure 1, there is a big difference in the lines of change between groups. While there was a regular increase between the pre-test and post-test measurements of the participants in the Experimental group, there was little variation between the mean scores of the Control group. In terms of the follow-up tests, the scores of the participants in the Experimental group were still high. When the Control group's follow-up test chart is examined, it is almost the same with the Post-test.

It is possible to see that the CAMSR is very effective on mindfulness levels of the university students in experimental group. The persistence of the increase in mindfulness level was also demonstrated by the meaningful results of the follow-up tests.

### Findings Related to Life Satisfaction

The second variable of this study is life satisfaction. The t-test was used to test whether the pre-test mean scores of the Experimental and Control groups from the SWLS were equivalent to each other prior to the implementation of the program, and according to these results, the difference between the mean scores of both groups before the application was not significant [ $t(38) = ,217$ ;  $p > .05$ ] as seen in the Table 2. The mean and standard deviations of the scores of Experimental and Control groups according to three tests are given in the table below.

**Table 7.** Mean and Standard Deviation Values obtained from SWLS

Groups	n	Pre-test			Post-test			Follow-up test		
		$\bar{x}$	Ss	n	$\bar{x}$	Ss	n	$\bar{x}$	Ss	n
Experimental	20	9,95	3,51650	20	19,20	3,62157	20	18,85	3,66024	
Control	20	8,70	2,73573	20	9,00	2,53398	20	9,65	2,45539	

As shown in Table 7, the mean of the scores of Experimental group participants in the pre-test was  $\bar{x} = 9.95$ , while the post-test score was  $\bar{x} = 19.20$ . Accordingly, it can be said that there is an increase in the life satisfaction levels of the Experimental group participants, and the life satisfaction levels of the Control group participants who are not included in the applied program have a low increase.

Experimental and Control groups in the Pre-test, Post-test and Follow-up tests that the scores they received from SWLS is changing, it is possible to see the change in accordance with the hypothesis of the study. ANOVA test was performed to see whether this change was meaningful and whether the difference between the tests was significant in the desired direction. The results of ANOVA for repeated measurements applied to determine the significance of the differences between the experimental and control groups in terms of three tests are given in the table below.

**Table 8.** ANOVA Results of SWLS Measurements

Source of Variance	SS	Sd	ST	F	p
<b>Between Groups</b>	<b>2189,591</b>	<b>39</b>			
Group (Experimental/Control)	1421,408	1	1421,408	70,313	.000
Error	768,183	38	20,215		
<b>Within Groups</b>	<b>1458,001</b>	<b>56</b>			
Measure(ön-son-Follow-up)	627,717	2	313,858	68,295	.000
<b>Group*Measure</b>	<b>481,017</b>	<b>2</b>	<b>240,508</b>	<b>52,334</b>	<b>.000</b>
Error	349,267	76	4,596		
Total	<b>3647,592</b>	<b>95</b>			

$p < .05$

When we look at the table, it can be seen that the group effect is meaningfully significant ( $F(1-38) = 70,313$ ;  $p < .05$ ) in the repeated tests. According to this, it is possible to say that the difference between the mean scores of the two groups is meaningfully significant.

Besides, it was found that the difference between the mean of the scores obtained from all three measurements is meaningful ( $F(2-76) = 68,295$ ;  $p < .05$ ) without any discrimination in the Experimental and Control group. According to this, it can be said that Experimental group participants' life satisfaction levels changed into the process.

Considering the findings given in the tables above, it can be said that the second hypothesis proposed in this study was confirmed. According to the results of the analysis, it is seen that there is a significant difference between Experimental and Control groups' scores depending on the measurements. Besides, it was observed that according to the value obtained as a result of measurements, the effect of group \* measurement was significant ( $F(2-76) = 52,334$ ;  $p < .05$ ). Two comparisons were made with the Bonferroni test in order to find out the source of the significant difference seen in the Experimental and Control groups in the measurement \* group interaction.

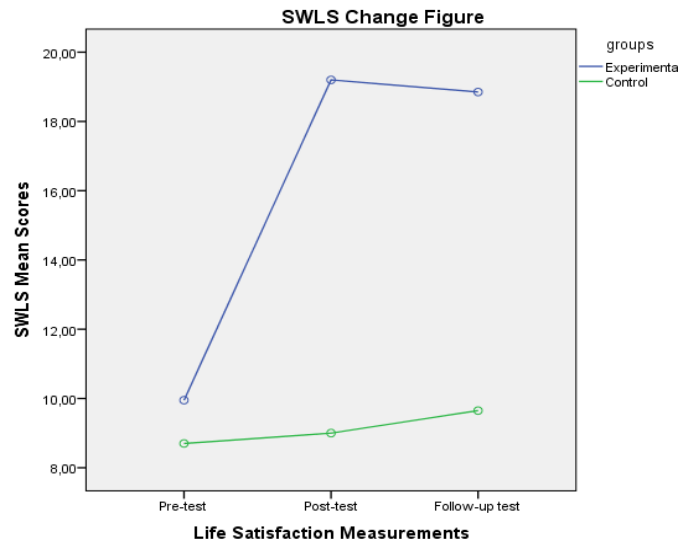
**Table 9.** Post-Hoc Table of SWLS

		Experimental			Control	
		Pre-test	Post-test	Follow-up	Pre-test	Post-test
Experimental	Pre-test	—	-9,250*	-8,900*	1,250	
	Post -test		—	,350		10,200*
	Follow-up			—		9,200*
Control	Pre-test				—	-,300
	Post-test					—
	Follow-up					-,650

$p < .05$

When Looking at table 9, we can see that the difference between SWLS' pre-test and post-test mean scores of experimental group was meaningfully significant ( $-9,250$ ;  $p < .05$ ). It is possible to say that the CAMSR significantly increased the life satisfaction levels of the Experimental group participants. In addition, it was observed that there was a significant difference ( $-8,900$ ;  $p < .05$ ) between the mean scores of the experimental group participants' follow-up test and post-test. According to this result, it is possible to say that the effectiveness of CAMSR on life satisfaction continues in the period after application process.

It is possible to see the effect of CAMSR on life satisfaction on graph of change between groups in the following figure.



**Figure 2.** Change of Life Satisfaction Scores Depending on Groups and Measurements

As seen in the graph above, a very significant difference is observed between the measurements indicating the change between the measurements of the groups. While there was a steady increase in the experimental group's pre-test and post-test, there was little variation between the scores of the Control group among these measurements. Considering the change in the follow-up test, the scores of the participants in the Experimental group were higher compared to the pre-test, although they were less than the post-test. When the Control group's follow-up test chart is examined, it is seen that it is almost the same with the Post-test. According to this graph, it can be said that Experimental group's life satisfaction scores showed an increase in post-test compared to the first test, and that the change was permanent according to the follow-up scores.

It is possible to say that CAMSR increases the levels of life satisfaction of individuals. This confirms the second hypothesis of the study considering the differences between the groups regarding the life satisfaction levels. The persistence of the increase in life satisfaction levels was demonstrated by the significant results in the follow-up tests.

### Findings Related to Stress

In this study, the third and last variable is stress, and the findings and comments about this variable are included in this section. To examine the last hypothesis, the mean scores of experimental group participants are increased by CAMSR or not. The means and standard deviations of the scores of Experimental and Control groups obtained from PSS according to Pre-test, Post-test and Follow-up test are presented in the table below.

**Table 10.** The Mean and Standard Deviation Values of PSS

Groups	Pre-test			Post-test			Follow-up test		
	n	$\bar{x}$	Ss	n	$\bar{x}$	Ss	n	$\bar{x}$	Ss
Experimental	20	23,70	2,27342	20	8,30	2,02874	20	8,80	2,26181
Control	20	23,45	2,62528	20	22,50	2,43872	20	20,95	3,23590

In the table, the mean of the scores of Experimental group (n = 20) participants before the program PSS mean was measured as  $\bar{x} = 23.70$ , whereas the post-test scores were found  $\bar{x} = 8.30$ . It can be said that there is a decrease in the stress levels of the Experimental group participants after CAMSR implementation. In the follow-up test results, in terms of stress scores, the mean score from the Follow-up test of the Experimental group was found to be  $\bar{x} = 8.18$ . According to the follow-up test results, there was a slight increase in the mean scores of the Experimental group participants.

**Table 11.** ANOVA Results of PSS Measurements

Source of Variance	KT	Sd	KO	F	p
Between Groups	<b>2797,033</b>	<b>39</b>			
Group (Experimental/Control)	2270,700	1	2270,700	163,939	.000
Error	526,333	38	13,851		
Within Groups	<b>3316,667</b>	<b>56</b>			
Measure(ön-son-Follow-up)	1903,950	2	951,975	380,456	.000
<b>Group*Measure</b>	1222,550	2	611,275	244,296	.000
Error	190,167	76	2,502		
Total	<b>6113,7</b>	<b>95</b>			

p< .05

When Table 11 was taken into consideration, the effect of the group in the Experimental and Control groups was meaningfully significant ( $F(1-38) = 163.939$ ;  $p < .05$ ). According to this, it can be said that the difference between the mean scores of the two groups is significant. On the other hand, it was found that the difference between the mean scores of the participants in all three measurements was significant ( $F(2-76) = 380,456$ ;  $p < .05$ ). Hence, it can be said that the stress levels of the participants of Experimental changed as a result of the applied program without discriminating the group.

Considering the findings given in the tables above, it is possible to say that the third hypothesis proposed in this study was confirmed. According to the results obtained from the analysis, it can be seen that there is a significant difference between Experimental and Control groups depending on the measurements. Besides, it was observed that the value obtained as a result of examining the effect of group \* measurement was significant ( $F(2-76) = 244,296$ ;  $p < .05$ ). Two comparisons were made with the Bonferroni test in order to find out the source of the significant difference seen in the Experimental and Control groups in the measurement and measurement \* group interaction. Double comparison results of Experimental and Control group are shown in the table below.

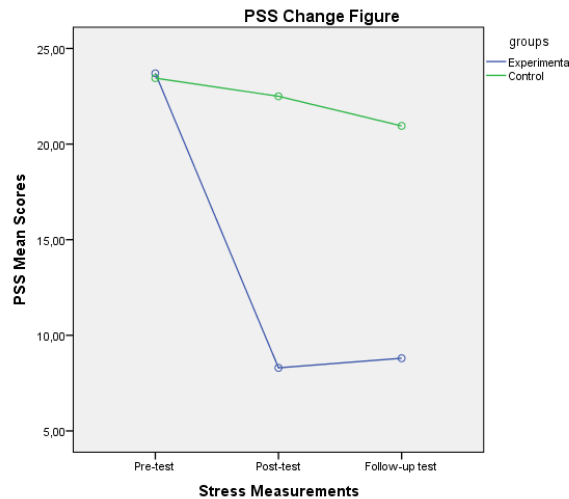
**Table 12.** Post-Hoc Table of PSS

		Experimental			Control		
		Pre-test	Son -test	Follow-up	Pre-test	Post-test	Follow-up
Experimental	Pre-test	—	15,400*	14,900*	,250		
	Post-test		—	-,500*		-14,200*	
	Follow-up			—			-12,150*
	Pre-test				—	,950	2,500*
Control	Post-test					—	1,550*
	Follow-up						—

\*p< .05



When the table is analyzed, it is seen that there is a meaningfully significant change between the mean of pre-test and the mean of post-test of the experimental group (15,400;  $p < .05$ ). According to this result, it can be said that the applied program significantly decreased the stress levels of the Experimental group participants. In addition, it was observed that there was a significant difference (14,900;  $p < .05$ ) between the mean scores of the experimental group participants' pre-test scores and their follow-up test scores. According to this result, it is possible to say that the effectiveness of CAMSR on the levels of stress persists after the application and has a significant effect on permanence.



**Figure 3.** Change of Stress Scores Depending on Groups and Measurements

As seen in Figure 3, there is a significant difference between the measurements. While there is a regular decrease in the Pre-test and Post-test measurements of the Experimental group, there is little variation in the Control group's scores in these tests. Considering the change in the follow-up test, the scores of the participants in the Experimental group were lower than the post-test, but they were still lower than the pre-test significantly. According to the Follow-up scores, the change was permanent.

It is possible to say that the last hypothesis was confirmed with the results of measurements. The persistence of the decrease in stress levels was also demonstrated by the meaningful results of the follow-up tests. In conclusion, considering all findings, it is possible to say that the three hypotheses discussed within the scope of this study were performed by revealing significant results.

## DISCUSSION

As the aim of this study is to examine the effects of CAMSR on Mindfulness, Stress and Life Satisfaction levels, an experimental process was performed. The data obtained from applied scales were analyzed by using the quantitative research design and the findings in the previous section were revealed. To enable students to learn and develop coping strategies against stressors they could face in their life and at school both culturally responsive and mindfulness-based stress reduction program prepared. The findings on the hypothesis were presented, and now discussions are given in accordance with the findings of three different variables.

### *Discussion on Mindfulness Results*

Although studies on MBSR are more common in the literature, there is few studies conducted in Turkey. "Mindfulness-based Stress Reduction" by Kabat-Zinn is implemented by many institutions around the world as an MBSR course and continues to be implemented by Kabat-Zinn at the Massachusetts Institute. This practice continues to be used as a treatment intervention for mental or emotional disorders especially stress, depression, anxiety and eating disorders, as well as physical

health disorders such as cancer, chronic pain, psoriasis and heart diseases. The MBSR program is also applied in non-clinical cases. Many studies are carried out on healthy individuals (Kabat-Zinn, 1982). This application, which is used more actively in private institutions, is in demand in our country and continues to be implemented in a few private places. However, a cultural adapted MBSR experimental study has not been conducted in our country. The aim of this study is to reveal an effective program for higher education institutions and adults. So, this program consists of mindfulness practices and culturally coping strategies.

The program was found to be successful in raising levels of mindfulness, according to the study's findings. According to the results of analysis, the first hypothesis was supported. The findings of those with low levels of mindfulness improved after the intervention, and the Experimental group's results differed significantly from those of the Post-test group, despite a minor decline. MBSR and related therapies increase mindfulness and attention while reducing rumination, negative thinking and stress, as they teach individuals to accept the content of their thoughts (Teasdale, Moore and Hayhurst, 2002). In terms of mindfulness theory, the findings from the present study provide positive support to the levels of mindfulness, as the participants' progress in CAMSR education is directly related to the increases in positive mental states. A similar relationship has been reported between mindfulness and depression, rumination, stress, cognition, and mood-state status (Nolen-Hoeksema, 1991; Segerstom et al., 2000).

The positive feedbacks on CAMSR showed the effective side of this program. In the literature, the rate of attendance to programs based on mindfulness is quite high. In similar studies, dropout rates during an MBSR intervention were less than 20% (Kabat-Zinn, 1982; Shapiro et al., 1988). While the rate of attendance in a study is 92% (Kabat-Zinn, 1982), there is also a study in which there is no discontinuation (Parswani, Sharma and Iyengar, 2013). There is a similar situation in this study. The participants continued to attend the all sessions of this program.

Since many studies on mindfulness in the literature are involved, the conclusions of the meta-analytical studies, which put together several studies and puts forward the coefficient of influence, clearly demonstrate the effect of mindfulness. In this respect, studies using meta-analytical techniques have a wider perspective in mindfulness editing (Baer, 2003; Grossman et al., 2004; Toneatto and Nguyen, 2007). Additionally, there are many studies carried out with clinical patients. And, there are many studies conducted on healthy individuals like in this study. In a meta-analysis study conducted by Khoury (2015), 29 studies on MBSR were investigated for a total of 2668 healthy participants.

In a previous meta-analysis study, Khoury et al. (2013) examined a total of 209 studies involving 12,111 participants and reported that only 45% of these studies were conducted on mindfulness variable. In these studies, participants who participated in mindfulness practices had increased mindfulness levels in post-tests and showed that their gains in follow-up tests continued. This supports the results of this study.

As a result, it was observed that CAMSR increased the mindfulness levels according to the results obtained from this study and it was seen that similar results were obtained as a result of the above-mentioned mindfulness-based programs. Meta-analysis studies covering a large part of the studies on the subject were mentioned, and it is possible to see the results of many studies related to this subject have given similar results related to the mindfulness levels discussed in this study.

### **Discussion on Life Satisfaction**

As a result of the literature reviews, there are mainly experimental studies on mindfulness-based programs examining the concept of psychological well-being, not specifically life satisfaction. As we know life satisfaction takes place as one of the concepts of well-being. MBSR was originally developed to treat the psychological and physical well-being of individuals with chronic pain and to support their psychological well-being (Kabat-Zinn, 1982). In addition to many studies supporting the

results of life satisfaction findings, it has been tried to give the results of meta-analysis studies including life satisfaction results.

In this context, in the meta-analysis study carried out by Khoury et al., the studies including the MBSR practices on healthy individuals were discussed and it was stated that these studies contributed to a significant decrease in the stress and increased the quality of life, satisfaction with life and psychological well-being (Khoury et al., 2015). In this meta-analysis study, 29 studies with a total of 2668 healthy participants were studied and the coefficient of influence ( $n = 26$ ; Hedge's  $g = .55$ ; 95% CI [.44, .66],  $p < .00001$ ) was found. In this meta-analysis study which includes Experimental studies, it has been shown that there is a moderate effect on the variables.

In a study by Carmody and Baer (2008), they showed that mindfulness-based stress reduction program increased the level of mindfulness, level of well-being and life satisfaction of adult people, whereas stress levels decreased. The application of mindfulness practices increases the level of mindfulness, and this leads to a decrease in symptoms and positively affects the psychological well-being of individuals (Carmody and Baer, 2008). In this study, life satisfaction is considered as a sub-dimension of psychological well-being, and it has been suggested that the applied program has a positive effect on life satisfaction.

In the study of Fjorback et al. (2011) showed that MBSR improves mental health and prevents depressive relapse. Psychological well-being and life satisfaction levels of the individuals who are deprived of depressive status have been found to be positively increased. This is the case seen in 21 of the 73 studies included in the review (Fjorback et al., 2011). In their study, it was stated that all of the studies taken place in the review study reduced the stress levels. It was stated that life satisfaction levels were moderately increased in all 21 studies including life satisfaction concept.

As mentioned earlier, it is known that MBSR is carried out not only on healthy individuals but also on individuals with many different diseases and different results can be obtained. One of these studies, Huang and Lu Shi (2016) carried out their study on breast cancer patients. They stated that life satisfaction is considered as sub-dimension of well-being and mindfulness-based program has positive effects on patients and increases mental health, quality of life and life satisfaction levels. Similarly, in the review study conducted by Janssen et al. (2018), 24 studies on MBSR were discussed and it was stated that 15 of these studies highly increased mindfulness and quality of life.

In another study on clinical patients, Witek-Janusek et al. (2008) reported that patients with cancer had undergone an MBSR program and improved quality of life and increased life satisfaction levels. On the other hand, Kabat-Zinn expresses MBSR as a popular mind-body medicine intervention that can help the patients to cope with chronic pain, stress and diseases, to relieve their pain, to improve their quality of life, to improve life satisfaction positively and to feel themselves as a whole. (Kabat-Zinn, 1982, 2003, 2011). Developed in this respect, this program has a very successful background in positively affecting life satisfaction levels.

As a result, it can said that prepared program is effective on life satisfaction levels and these results show similarity with the studies carried out on same subject. We can also say that a culturally responsive and mindfulness-based stress reduction program increases the levels of life satisfaction. And this program is effective on well-being.

### ***Discussions on Stress***

In the third hypothesis discussed in the study, the program is designed to reduce stress levels of individuals. As a result of the findings obtained in this context, the stress levels of the individuals have decreased. Considering the studies that include programs based on mindfulness, many of these studies have revealed a decrease in stress levels. The findings of this study, which are based on the cultural background and the mindfulness-based stress program, are consistent with the empirical studies in the literature on the reduction of stress and rumination of MBSR training (Baer, 2003;

Brown and Ryan, 2003; Feldman et al., 2007; Jain et al., 2007; Ramel et al., 2004). In this direction, there are many studies in the literature, as well as meta-analysis and review studies. In this context, it is thought that the studies consisting of many studies results will be more effective in explaining the findings in this study.

Sharma et al. (2014) examined 17 studies carried out on healthy individuals. In their study, it was found that all interventions had some positive effects on decreasing stress levels as well as on psychological or physiological results related to stress (Sharma et al., 2014). In addition, Khoury (2013) reported in his meta-analysis that the effect of mindfulness based therapies decreased the levels of stress, anxiety and depression, physical illnesses or psychological disorders (Baer, 2003; Bohlmeijer et al., 2010; Chiesa and Serretti, 2010, 2011; Cramer et al., 2012; de Vibe et al., 2012; Eberth and Sedlmeier, 2012; Fjorback et al., 2011; Grossman et al., 2004; Hofmann et al., 2010; Klainin-Yobas et al., 2012; Ledesma and Kumano, 2009; Musial et al., 2011; Piet and Hougaard, 2011; Zainal et al., 2012). This review and meta-analysis studies have different and inconsistent results, the criteria they define, the factors included in the program, the inclusion of different individuals with physiological or psychological disorders in the practices and the number of participants.

In the review study conducted by Luberto et al. (2018), some data bases were selected as the criterion and the effect of MBSR on healthy individuals was examined. In the review of 27 studies in which the total number of participants was calculated as 1714, it was stated that the program was moderately effective on the observable outcomes. In addition, Eberth and Sedlmeier (2012), in their meta-analysis study, examined 39 studies that consisted of mindfulness-based practices on healthy adult individuals and had control group. In this review, most of the studies showed positive effect to decrease stress levels of the individuals.

In the meta-analysis study conducted by Fjorback et al. (2011), 21 researches with randomly selected groups were selected. As a result of this review, the effect size of mindfulness practices on stress was found to be moderate. Klainin-Yobas, Cho and Creed (2012), in their meta-analysis study, which measures the effects of mindfulness-based stress programs on depression, have included 39 studies in accordance with the criteria, and these studies have shown that they have a high degree of impact on stress as well as depression.

As a result, it was seen that stress measurements were performed in many studies including mindfulness practices in the literature. Meta-analysis studies including most of these studies are given in this section. It has been observed that the practices carried out on healthy individuals generally reduce stress levels. In this context, it was determined that the stress findings of this study showed appropriate results for many studies in the literature.

## RESULTS

Sociological, economic, and psychological changes occur rapidly in our country where many sufferings are experienced in the historical process. Besides, the effects of the changes in the internal dynamics on the education system of our country has been a subject of debate for many years. In addition to this, young people who are in the education system of our country from an early age are exposed to many stresses such as exams, divorces, loss, and regional problems. Each situation mentioned above directly or indirectly affects the lives of young individuals and makes stress situations in their lives. The aim of this study is to develop a program for coping with stress in higher education institutions. The effectiveness of a mindfulness-based and culture-sensitive stress program is discussed. As a result of the findings, it can be said that there is sufficient evidence that the program has positive effects on individuals, increases mindfulness and life satisfaction levels and decreases stress levels.

Considering the hypotheses taken in the scope of the research, firstly it has been tried to increase the mindfulness levels of students. The findings of this study showed that the level of

mindfulness of the participants increased. Considering that the Experimental and Control groups have close scores in the pre-test application, it was observed that the mindfulness levels of the Experimental group were increased significantly after the program. There was a low increase in the scores of the participants in the Control group. In addition, follow-up tests were performed after approximately two months following the implementation of the program, and after these measurements, the findings of the Experimental group were found to provide sufficient evidence of persistence. Although the concept of mindfulness is based on Asia as its origin, it is an important concept in many different parts of the world today, especially in America. In this context, it is stated in the scope of this research that the concept of mindfulness has many sub-dimensions in our culture, and it has an effect on individuals when a program is prepared in accordance with our culture.

The variable in this study and the second hypothesis is life satisfaction. In the context of the program, it was aimed to increase the life satisfaction of the participants in close relationship with psychological well-being. The findings of the pre-test and post-test results showed that the prepared program increased the life satisfaction levels of the individuals. The results of the analyzes showed that the increase in life satisfaction scores were significant compared to the Control group. In follow-up tests conducted to measure the persistence of the scores obtained after the application, it was found that the individuals continued the techniques within the program and that the life satisfaction scores were significantly higher. It is important to improve the attitudes of individuals on their psychological well-being and life satisfaction by focusing on the main focus and judicial acceptance of mindfulness. From this point of view, techniques are included in the program in a line close to the thought of praise and opinion. In this context, the findings of the program were found to increase the life satisfaction of the individuals.

Among the main objectives of the programs prepared on the basis of mindfulness, the stress which is often in the first place and at the starting point of this approach is included in the third hypothesis of this study. Likewise, the aim of this study is to reduce the stress levels of individuals. In the pre-test results, when Experimental and Control groups have close stress levels, the stress scores of the Experimental group decreased considerably in post-test results. The results of the analyzes revealed that the program reduces the stress levels of the individuals. When the follow-up test results were examined, the decrease in the stress scores was maintained and the permanence of the effects of the program was supported by the significant findings. It is known that the stress that affects the lives of individuals in many ways has negative consequences because of long or deep experiences. In this study, it is aimed to give a new perspective to the life of individuals to reduce or prevent these negative effects.

As a result, CAMSR is an appropriate program for young people in Turkey for developing coping strategies towards stress. Besides, this program can be applied and examined on other variables, such as depression, insomnia, anxiety, and some other physical and psychological disorders. On the other hand, though it has cultural strategies this program can be performed in other cultures to see the effectiveness. Considering the results of this study, we can say that this is an effective process for students dealing with many stressors in modern world with rapid change.

**Conflicts of Interest:** The authors declare no potential conflict of interest in this study.

**Funding Details:** No funding or grant was received from any institution or organization for this research.

**CRedit Author Statement:** Both authors contributed equally to the each part of the study.

**Ethical Statement:** Ethical permission is received as part of the thesis numbered “531267” in which this manuscript was produced.

## REFERENCES

- Alonso J., Angermeyer M. C., Bernert S., Bruffaerets, R., Brugha, T. S., Bryson, H. and Vilagut, G. (2004). "Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project". *Acta Psychiatr Scand* 109(S420), 21–27.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical psychology: Science and practice*, 10(2), 125-143.
- Bilge, A., Ögce, F., Genç, R. E. and Oran, N. T. (2009). Algılanan stres ölçeği (ASÖ)'nin Türkçe versiyonunun psikometrik uygunluğu. *Ege Üniversitesi Hemşirelik Yüksekokulu Dergisi*, 2(25), 61-72.
- Blyth F, March L, Brnabic J, Jorm L, Williamson M and Cousins M. (2001). Chronic pain in Australia: a prevalence study. *Pain*. 89:127–36.
- Bohlmeijer, E., Prenger, R., Taal, E. and Cuijpers, P. (2010). The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: a meta-analysis. *Journal of psychosomatic research*, 68(6), 539-544.
- Brown, K. W., and Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.
- Carmody, J. and Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of behavioral medicine*, 31(1), 23-33.
- Catala E, Reig E, Artes M, Aliaga L, Lopez J. and Segu J. (2002). Prevalence of pain in the Spanish population: telephone survey in 5000 homes. *Eur J Pain*. 6:133–40.
- Chang, V. Y., Palesh, O., Caldwell, R., Glasgow, N., Abramson, M., Luskin, F., and Koopman, C. (2004). The effects of a mindfulness-based stress reduction program on stress, mindfulness self-efficacy, and positive states of mind. *Stress and Health*, 20(3), 141-147.
- Chiesa, A. and Serretti, A. (2010). A systematic review of neurobiological and clinical features of mindfulness meditations. *Psychological medicine*, 40(8), 1239-1252.
- Chiesa, A. and Serretti, A. (2011). Mindfulness based cognitive therapy for psychiatric disorders: a systematic review and meta-analysis. *Psychiatry research*, 187(3), 441-453.
- Ciaramella A. and Poli P. (2001). Assessment of depression among cancer patients: the role pain, cancer type and treatment. *Psychooncol*. 10: 156–65.
- Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.
- Cramer, H., Lauche, R., Paul, A. and Dobos, G. (2012). Mindfulness-based stress reduction for breast cancer—a systematic review and meta-analysis. *Current Oncology*, 19(5), 45-54.
- Dağlı, A. and Baysal, N. (2016). Yaşam doyumu ölçeğinin Türkçe'ye uyarlanması: Geçerlik ve güvenirlik çalışması. *Elektronik Sosyal Bilimler Dergisi*, 15(59).
- de Vibe, M., Solhaug, I., Tyssen, R., Friberg, O., Rosenvinge, J. H., Sørli, T. and Bjørndal, A. (2013). Mindfulness training for stress management: a randomised controlled study of medical and psychology students. *BMC medical education*, 13(1), 107.

- Diener, E. (1984). Subjective well-being. *Psychological bulletin*, 95(3), 542-561.
- Diener, E. D., Emmons, R. A., Larsen, R. J., and Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment*, 49(1), 71-75.
- Eberth, J. and Sedlmeier, P. (2012). The effects of mindfulness meditation: a meta-analysis. *Mindfulness*, 3(3), 174-189.
- Eskin, M., Harlak, H., Demirkıran, F. and Dereboy, Ç. (2013). Algılanan stres ölçeğinin Türkçeye uyarlanması: güvenirlik ve geçerlik analizi. *New Symposium Journal* (Vol. 51, No. 3, pp. 132-140).
- Feldman, G., Hayes, A., Kumar, S., Greeson, J. and Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, 29(3), 177-194.
- Fjorback, L. O., Arendt, M., Ørnbøl, E., Fink, P. and Walach, H. (2011). Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy—a systematic review of randomized controlled trials. *Acta Psychiatrica Scandinavica*, 124(2), 102-119.
- Frey, R. (1999). *Stress*. In Gale Encyclopedia of Medicine (Ed. 1, s. 2736). Detroit, MI: Gale Research, Inc.
- Grossman, P., Niemann, L., Schmidt, S. and Walach, H. (2004). Mindfulness-based stress reduction and health benefits. A meta-analysis. *Journal of Psychosomatic Research*, 57, 35-43.
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., and Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *Journal of Consulting and Clinical Psychology*, 78, 169–183.
- Huang, H. P., He, M., Wang, H. Y. and Zhou, M. (2016). A meta-analysis of the benefits of mindfulness-based stress reduction (MBSR) on psychological function among breast cancer (BC) survivors. *Breast Cancer*, 23(4), 568-576.
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I. and Schwartz, G. E. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: effects on distress, positive states of mind, rumination, and distraction. *Annals of behavioral medicine*, 33(1), 11-21.
- Janssen, M., Heerkens, Y., Kuijer, W., Van Der Heijden, B. and Engels, J. (2018). Effects of Mindfulness-Based Stress Reduction on employees' mental health: A systematic review. *PloS one*, 13(1), 324-34.
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *Gen. Hosp. Psychiatry*, 4:33-47.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future. *Clinical Psychology: Science and Practice*, 10:144-156.
- Kabat-Zinn, J. (2005). *Coming to our senses: Healing ourselves and the world through mindfulness*. United Kingdom: Hachette.
- Kabat-Zinn, J. (2011). Some reflections on the origins of MBSR, skillful means, and the trouble with maps. *Contemporary Buddhism*, 12(01), 281-306.

- Kabat-Zinn, J., Lipworth, L. and Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine*, 8(2), 163-190
- Kayri, M. (2009). Araştırmalarda Gruplar Arası Farkın Belirlenmesine Yönelik Çoklu Karşılaştırma (Post-Hoc) Teknikleri. *Journal of Social Science*, 55.
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V. and Hofmann, S. G. (2013). Mindfulness-based therapy: a comprehensive meta-analysis. *Clinical psychology review*, 33(6), 763-771.
- Khoury, B., Sharma, M., Rush, S. E. and Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: A meta-analysis. *Journal of psychosomatic research*, 78(6), 519-528.
- Klainin-Yobas, P., Cho, M. A. A. and Creedy, D. (2012). Efficacy of mindfulness-based interventions on depressive symptoms among people with mental disorders: A meta-analysis. *International journal of nursing studies*, 49(1), 109-121.
- Ledesma, D. and Kumano, H. (2009). Mindfulness-based stress reduction and cancer: a meta-analysis. *Psycho-Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer*, 18(6), 571-579.
- Lloyd-Jones D, Larson M, Beiser A, Levy D. Lifetime risk of developing coronary heart disease. *Lancet* 1999;353:89-92.
- Luberto, C. M., McLeish, A. C., Robertson, S. A., Avallone, K. M., Kraemer, K. M., ve Jeffries, E. R. (2014). The role of mindfulness skills in terms of distress tolerance: A pilot test among adult daily smokers. *The American journal on addictions*, 23(2), 184-188.
- Massie MJ, Popkin MK. Depressive disorders. In: Holland J, editor. *Psycho Oncology*. New York: Oxford University press, 1998. pp. 518-40.
- McElnay JC, McCallion RC. Adherence in the elderly. In: Myers LB, Midence K, editors. *Adherence to treatment in medical conditions*. Harwood Academic Publishers: Toronto, 1998. pp. 223-53.
- Musial, F., Büssing, A., Heusser, P., Choi, K. E. and Ostermann, T. (2011). Mindfulness-based stress reduction for integrative cancer care—a summary of evidence. *Complementary Medicine Research*, 18(4), 192-202.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *J. Abnorm. Psychol.*, 100: 569-582.
- Ormel J, Von Korff M, Burger H, Scott K, Demyttenaere K, Huang Y, et al. Mental disorders among persons with heart disease—results from World Mental Health Surveys. *Gen Hosp Psychiatry* 2007;29:325-32.
- Parswani, M. J., Sharma, M. P. and Iyengar, S. S. (2013). Mindfulness-based stress reduction program in coronary heart disease: A randomized control trial. *International journal of yoga*, 6(2), 111.
- Patten SB. Long-term medical conditions and major depression in a Canadian population study at waves 1 and 2. *J Affect Disord* 2001;63: 35-41.
- Piet, J. and Hougaard, E. (2011). The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: a systematic review and meta-analysis. *Clinical psychology review*, 31(6), 1032-1040.



- Ramel, W., Goldin, P. R., Carmona, P. E. and McQuaid, J. R. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive therapy and research*, 28(4), 433-455.
- Reichers, A. E. Wanous, J. P. and Austin, J. T. (1997). Understanding and managing cynicism about organizational change. *Academy of Management Executive*, 11 (1). 48-59.
- Rosenzweig, S., Reibel, D. K., Greeson, J. M., Brainard, G. C. and Hojat, M. (2003). Mindfulness-based stress reduction lowers psychological distress in medical students. *Teaching and Learning in Medicine*, 15(2), 88-92.
- Segerstrom, S. C., Tsao, J. C., Alden, L. E. and Craske, M. G. (2000). Worry and rumination: Repetitive thought as a concomitant and predictor of negative mood. *Cognitive therapy and Research*, 24(6), 671-688.
- Selye, H. (1955). Stress and disease. *The laryngoscope*, 65(7), 500-514.
- Shapiro, S. L., Carlson, L. E., Astin, J. A. and Freedman, B. (2006). Mechanisms of mindfulness. *Journal of clinical psychology*, 62(3), 373-386.
- Sharma, M. and Rush, S. E. (2014). Mindfulness-based stress reduction as a stress management intervention for healthy individuals: A systematic review. *Journal of evidence-based complementary & alternative medicine*, 19(4), 271-286.
- Smith, J.E., Richardson, J., Hoffman, C. and Pilkington, K. (2005) Mindfulness-based stress reduction as supportive therapy in cancer care: Systematic review. *J. Adv. Nurs.*, 52, 315-327.
- Teasdale, J., Segal, Z. and Williams, J. (1995). How does cognitive therapy prevent depressive relapse and why should attentional control (mindfulness) training help? *Behav. Res. Ther.*, 33:25-39
- Toneatto, T. and Nguyen, L. (2007). Does mindfulness meditation improve anxiety and mood symptoms? A review of the controlled research. *The Canadian Journal of Psychiatry*, 52(4), 260-266.
- Verdurmen J, ten Have M, van Dorsselaer S. Psychische stoornissen bij mensen met een lichamelijke aandoening. Resultaten van de 'Netherlands Mental Health Survey and Incidence Study'. Utrecht: Trimbos-instituut, 2006.
- Witek-Janusek, L., Albuquerque, K., Chroniak, K. R., Chroniak, C., Durazo-Arvizu, R. and Mathews, H. L. (2008). Effect of mindfulness based stress reduction on immune function, quality of life and coping in women newly diagnosed with early stage breast cancer. *Brain, behavior, and immunity*, 22(6), 969-981.
- Zainal, N. Z., Booth, S. and Huppert, F. A. (2013). The efficacy of mindfulness-based stress reduction on mental health of breast cancer patients: A meta-analysis. *Psycho-Oncology*, 22(7), 1457-1465.

## Teaching and Learning Conceptions of Pre-service English Language Teachers

Hilal Güneş<sup>i</sup>

Hacettepe University

### Abstract

In this research, pre-service English language teachers' teaching and learning conceptions were explored with regards to gender and grade level. A total of 227 pre-service English language teachers studying at a state university in Turkey participated in the study. Data were collected through "The Teaching and Learning Conceptions Questionnaire (TLCQ)" and analysed quantitatively. Results showed that pre-service English language teachers have higher level of constructivist conception when compared to traditional conception. In addition, a statistically significant difference was detected between the participants' constructivist conceptions and their gender, in favour of females. Also, the participants' traditional conceptions differed significantly based on grade level with lower-level participants having higher level of traditional conception. The study concluded with the discussion of the results in relation to the earlier research and offered some pedagogical implications and suggestions. This study attempts to be helpful for English language education policy-makers, teacher educators, teachers, and material designers.

**Keywords:** English Language Teaching (ELT), Teaching and Learning Conceptions, Constructivist Approach, Teacher Education

**DOI:** 10.29329/ijpe.2023.534.6

**Submitted:** 21/09/2022

**Accepted:** 27/02/2023

**Published:** 01/04/2023

---

<sup>i</sup> Hilal Güneş, Research Assist, English Language Teaching, Hacettepe University, ORCID: 0000-0001-7952-2140

**Email:** hilaly.metu@gmail.com

## INTRODUCTION

Teaching and learning conceptions refer to teachers' beliefs related to their teaching and learning preferences along with roles of teachers and students (Chan & Elliot, 2004). There are generally two opposing conceptions about teaching and learning in the literature that are traditional and constructivist conceptions (Aypay, 2011; Chan & Elliot, 2004; Schunk, 2008). Traditional conception promotes a teacher-centered educational environment where the primary role of teacher is to present the topic and provide information to students (Cheng et. al., 2009). Rather than discoverer of knowledge, students are regarded as receivers of knowledge provided by teacher, without questioning it (Senemoğlu, 2004). Therefore, teachers are seen as the only authority in the classroom who control students (Brooks & Brooks, 1999). In traditional approach, the best teaching method is 'lecture method' as it provides as much information as possible (Chan & Elliot, 2004). Teachers generally stick to a specific course book, and they mostly use drilling and practice method (Prawat, 1992). Students are expected to be quiet and follow what the teacher instructs. In such classes, instead of meaningful and contextual learning, rote-learning occurs (Baş & Beyhan, 2013).

In traditional language learning environment, teachers are regarded as the knowledge holder who transmit it with the help of lectures and textbooks. Language teachers present the topic to the whole class, instead of using group work or pair work activities. In traditional ELT classrooms, the focus is mostly on grammar, vocabulary, mechanical drills, reading literary works, writing prescribed essays, translation, and spelling (Agola, 2004; Crandall, 1997; Larsen-Freeman, 2000). As the focus is on the structure of language, grammar rules and vocabulary items are memorized by the learners. In these classrooms, correctness is more important than meaning (Demirel, 2003; Reinfried, 2000; Richards & Rodgers, 2007). Since the language is not taught by using visuals and in a meaningful context, there is no connection between the new information and the previous one. Therefore, language learners have difficulty in making the knowledge concrete for them and engaging in the lesson (Gül, 2016; Kavanoz, 2006). Even though an advanced knowledge of grammar rules and words, language learners experience problems when listening and speaking in a communicative context (Büyükduman, 2005; Gül, 2016; Kırkgöz, 2009).

Contrary to traditional conception, the constructivist conception advocates a learner-centered and active learning environment where learners construct their own knowledge (Howard et al., 2000; Mayer 2004; Piaget, 1973). Without adhering to any specific person or doctrine, learners are expected to be responsible for their learning. Learners do not believe everything they hear; they always question the knowledge and make research in pursuit of truth (Chan & Elliot, 2004). Teachers act as facilitators and encourage students to make research, explore, discuss and express their ideas freely (Chan & Elliot, 2004; Dunlop & Grabinger, 1996; Vygotsky, 1978). Rather than using only drill and practice activities, teachers employ discussion, problem solving, task-based, and collaborative activities (Chan & Elliot, 2004; Tam, 2000). Teachers are aware of the fact that each student is unique, so they teach by paying attention to individual differences. Teachers understand the feelings of the students, respect students' ideas, and make students feel important by valuing their ideas (Brooks & Brooks, 1999; Chan & Elliot, 2004).

Principles of constructivist conception in language teaching include intercultural awareness, creativity, autonomy, learning awareness, content awareness, real and complex situations, and collaborative learning (Aljohani, 2017; Reinfried, 2000). One of the basic premises of constructivist language teaching is its 'action-orientedness'. Main components of action-oriented method involve cooperative learning (e.g., pair work, group work), project-based learning, theme-based learning, learning by teaching, peer learning and individualisation of learning (Aljohani, 2017; Kaufman, 2004; Nikitina, 2010). Another important feature of constructivist language learning is 'content-orientedness' which promotes that acquiring a language is more effective in authentic and complex learning situation (Oxford, 1990; Reinfried, 2000). Thus, language teaching techniques and activities are designed and utilized in a way that will enable students to use language in authentic, pragmatic and functional way (Demircan, 1988; Gül, 2017; Güneş & Karaazmak, 2017). In constructivist language classrooms, students are expected to be proactive and shape knowledge according to their own

understanding, rather than passively absorbing it (Aljohani, 2017; Marlowe & Page, 2005). Language learners engage in critical thinking, investigating and solving real-life problems, collaborating with their peers, developing models, diagrams and projects, discovering, writing articles, journaling and so on (Aljohani, 2017; Howard et al., 2000). In constructivist conception, the ultimate goal is to equip students with the necessary skills to use the language effectively outside the class. Hence, less attention is paid to grammatical rules and there is more focus on fluency than accuracy in order to make students use language in a meaningful way (Crandall, 1997; Gül, 2016; Nunan, 2000). Moreover, students are encouraged to be autonomous learners and use their own learning strategies during their language learning experience (Brooks & Brooks, 1999; Marlowe & Page, 2005; Nunan, 2000; Piaget, 1973).

Since 2005, there is a transition from traditional to constructive approach in education. Likewise, in the field of ELT, constructivist approach is highly valued and promoted (Aljohani, 2017; Gül, 2016; Kırkgöz, 2009; Kavanoz, 2006). Especially, the emergence of content-based pedagogical paradigms has opened up new opportunities for language teaching and learning (Kaufman, 2004). The recent literature has revealed that constructivist way of teaching and learning English is more effective and beneficial compared to the traditional way (Al Muhaimed, 2013; Nikitina, 2010; Sengupta, 2015). In this respect, English language teachers are expected to adopt a constructivist approach by creating a learner-centered class environment, encouraging students to construct their own knowledge, facilitating students' learning, respecting individual differences, and supporting learner autonomy.

In the literature, teaching and learning conceptions of elementary school teachers (Baş, 2014), primary school teachers (Engin & Daşdemir, 2015), and English language teachers (Mardiha & Alibakhshi, 2020) were explored in the context of constructivist and traditional approaches. In addition, a variety of studies investigated teaching and learning conceptions of pre-service teachers from different departments in Turkey (Aydın et al., 2015; Aypay, 2011; Baş & Beyhan, 2013; Bıkmaz, 2017; Oğuz, 2011; Şahan & Terzi, 2015; Şahin & Yılmaz, 2011) and around the world (Chan et al., 2007; Löfström & Poom-Valickis, 2013; Tang et al., 2012). Although there is a plethora of research on teaching and learning conceptions of teachers and pre-service teachers from different fields, there is a lack of research investigating pre-service English language teachers' teaching and learning conceptions within the context of traditional and constructivist approaches. Therefore, it has been deemed important to investigate the teaching and learning conceptions of pre-service English language teachers in Turkey as it will shed light on their teaching behaviours in the classroom and how they will teach in the future.

Within this background, the primary purpose of this study is to find out the teaching and learning conceptions of pre-service English language teachers. The secondary purpose is to determine whether the participants' teaching and learning conceptions differ based on their gender and grade. To this end, this study seeks answers to the following research questions:

1. What are the teaching and learning conceptions of pre-service English language teachers?
2. Do pre-service English language teachers' conceptions of teaching and learning show a significant difference according to their gender and grade?

## **METHODOLOGY**

### **Research design**

In this research, from descriptive research methods, survey method was used. Survey method is used to determine perceptions, actions, and beliefs of people as well as to identify the relationship between different variables and make predictions (Christensen, Johnson & Turner, 2015). It is a cross-sectional survey study adopting a quantitative methodology.

## Participants

For the selection of the participants, convenience sampling method was used. The sample of the study consisted of 227 pre-service English language teachers studying at a state university in Turkey, who volunteered to take part in the study. A consent form was received from the participants indicating that they voluntarily participated in the study. Participants' demographic information is provided below:

**Table 1** Demographic information of the participants

Variables		f	%	Total
Gender	Females	155	68.3	227
	Males	72	31.7	
Grade	1 <sup>st</sup> grade	47	20.7	227
	2 <sup>nd</sup> grade	78	34.4	
	3 <sup>rd</sup> grade	51	22.5	
	4 <sup>th</sup> grade	51	22.5	

## Data Collection

This study adopts a quantitative approach for the data collection. Data were collected through “The Teaching and Learning Conceptions Questionnaire (TLCQ)” which was developed by Chan and Elliot (2004) and adapted to Turkish by Aypay (2011).

For the adaptation of the TLCQ scale, translation and back-translation method was employed by Aypay (2011). After confirming that there was no difference between the meanings of the instruments, validity and reliability studies were conducted. A confirmatory factor analysis indicated an acceptable fit (RMSEA= .067). Cronbach reliability coefficient for the whole instrument was .71, while sub-scale reliabilities were reported as .88 for the constructivist conception and .83 for the traditional conception (Aypay, 2011). In the current study, the Cronbach alpha coefficient for the overall instrument was calculated as .74, while it was .78 for constructivist conception and .84 for traditional conception.

The scale consists of 30 five-point likert-type items ranging from 1= Strongly Disagree to 5= Strongly Agree. The scale includes two sub-dimensions (1) Constructivist conception consisting of 12 items and (2) Traditional conception consisting of 18 items. There are not any reverse-scored items in the scale. Participants do not receive a total score from the overall scale. The higher the score they get from any sub dimension, the higher their teaching and learning conceptions for that particular dimension.

## Data Analysis

Before the analysis of the data, test of normality was conducted to determine if the data were normally distributed. Inspection of mean scores, trimmed mean scores, skewness/kurtosis values, and Histogram and Normal Q-Q Plots revealed that the data were normally distributed (Pallant, 2010). Therefore, parametric tests were calculated for the analysis of the data. Data were analysed by using SPSS (Statistical Package for the Social Sciences) 26.0 software.

In order to determine pre-service English language teachers' teaching and learning conceptions, descriptive statistics were calculated. Secondly, to find out whether there is a significant difference between the participants' teaching and learning conceptions and their gender, an independent samples t-test was conducted. Lastly, to determine if the participants' teaching and learning conceptions differ based on their grade levels, a one-way between groups ANOVA test was used. For the significant F values, the Bonferroni test was used to determine the source of significance.

## FINDINGS

RQ1. What are the teaching and learning conceptions of pre-service English language teachers?

In order to answer the first research question, descriptive statistics were used. As Table 2 shows, the mean score for the constructivist conception was  $M=4.39$  ( $SD=.49$ ). This finding reveals that the pre-service English language teachers highly adopt constructivist conception. On the other hand, the mean value for traditional conception was  $M=2.75$  ( $SD=.59$ ), indicating that pre-service English language teachers prefer constructivist approach over the traditional approach.

**Table 2** Descriptive statistics for teaching and learning conceptions of participants

	N	M	SD
Constructivist	227	4.39	.49
Traditional	227	2.75	.59

RQ2. Do pre-service English language teachers' conceptions of teaching and learning show a significant difference according to their gender and grade?

To determine whether the participants' conceptions of teaching and learning differ significantly based on their gender, an independent samples t-test was conducted. As Table 3 indicates, there was not a significant difference in the pre-service English language teachers' traditional conceptions for females ( $M=2.71$ ,  $SD=.59$ ) and males ( $M=2.81$ ,  $SD=.60$ ;  $t(227)=-1.20$ ,  $p=.23$ , two-tailed). On the other hand, there was a significant difference in the participants' constructivist conceptions for females ( $M=4.44$ ,  $SD=.50$ ) and males ( $M=4.26$ ,  $SD=.47$ ;  $t(227)=2.55$ ,  $p=.01$ , two-tailed), with a moderate effect size (Cohen's  $d=.37$ , Cohen, 1988).

**Table 3** T-test results based on gender

		N	M	SD	t	p
Constructivist	Females	155	4.44	.50	2.55	.23
	Males	72	4.26	.47		
Traditional	Females	155	2.71	.59	-1.20	.01
	Males	72	2.81	.60		

To scrutinize if there is a difference participants' conceptions of teaching and learning based on their grades, a one-way between-groups ANOVA test was conducted. As indicated by Table 4, there was not statically significant difference at the  $p<.05$  level in constructivist conceptions of the participants based on their grades. However, there was a statistically significant difference at the  $p<.01$  level in traditional conceptions of the participants for four different grades;  $F(3, 223)=7.791$ ,  $p=.00$ . The effect size was calculated as medium (eta squared = .09). Post-hoc comparisons using the Bonferroni test indicated that the mean score for first graders ( $M=3.06$ ,  $SD=.59$ ) was significantly different from second graders ( $M=2.69$ ,  $SD=.57$ ) and fourth graders ( $M=2.51$ ,  $SD=.55$ ) Third graders ( $M=2.78$ ,  $SD=.57$ ) did not differ significantly from first, second, or fourth graders.

**Table 4** One-way between-groups ANOVA test results based on grade

		Sum of Squares	df	Mean Square	F	p	Group Differences
Constructivist	Between Groups	.448	3	.149	.609	.610	none
	Within Groups	54.712	223	.245			
	Total	55.160					
Traditional	Between Groups	7.646	3	2.549	7.791	.000	1 <sup>st</sup> graders> 2 <sup>nd</sup> graders, $p<.01$
	Within Groups	72.954	223	.327			1 <sup>st</sup> graders> 4 <sup>th</sup> graders, $p<.01$
	Total	80.600					

## DISCUSSION AND CONCLUSION

This study was designed to explore the teaching and learning conceptions of pre-service English language teachers and determine whether their conceptions differ based on gender and grade levels. The sample of the study consisted of 227 pre-service English language teachers who study at a state university in Turkey. Data were collected through “The Teaching and Learning Conceptions Questionnaire (TLCQ)” which was developed by Chan and Elliot (2004) and adapted into Turkish by Aypay (2011).

According to results of the analyses, pre-service English language teachers have a high level of constructivist conception while they possess a lower level of traditional conception. Therefore, it could be postulated that pre-service English language teachers prefer constructivist approach over the traditional approach in their teaching and learning process. This finding is broadly consistent with a large number of earlier studies (Aydın et al., 2015; Aypay, 2011; Bıkmaz, 2017; Chan et al., 2007; Cheng et al., 2009; Engin & Daşdemir, 2015; Şahan & Terzi, 2015; Şahin & Yılmaz, 2011; Mardıha & Alibakhshi, 2020; Oğuz, 2011; Tang et al., 2012) which revealed that teachers/pre-service teachers highly adopt constructivist conception compared to traditional conception. A possible explanation for this result might be the reflection of the curriculum development based on the constructivist learning approach in the Turkish Education System in 2005-2006 academic year. It can be deduced that, the curriculum and practices in teacher education faculties positively influenced beliefs of pre-service English language teachers regarding the constructivist conception.

Another result of the study was that there was a significant difference between the participants' constructivist conceptions and their gender; females possessing slightly higher levels of constructivist teaching and learning understanding than males. On the other hand, traditional conceptions of the participants did not differ significantly in terms of gender. This finding matches those found in earlier studies. For example, Aypay (2011) also found a significant differentiation in favour of female pre-service teachers in constructivist conception. Likewise, a number of studies detected a statistical difference that male teachers/pre-service have a higher level of traditional conception than their female counterparts (Aypay, 2011; Baş, 2014; Oğuz, 2011; Şahan & Terzi, 2015). It can therefore be assumed that male participants prefer a more traditional approach when compared to females; while female participants hold a higher level of constructivist conception. According to Oğuz (2011) this difference might stem from the educational experiences of the males in the family and at school along with the characteristics of the socio-cultural environment in which they grew up. The socio-cultural environment might have developed more rigid and authoritarian attitudes in males than females.

Lastly, while there was not statically significant difference in constructivist conceptions of the participants based on their grades, a significant difference was detected in traditional conceptions for first, second and fourth graders. It was revealed that, the traditional views of 1<sup>st</sup> year pre-service teachers were higher than 2<sup>nd</sup> graders and 4<sup>th</sup> graders. This finding is in agreement with the studies revealing that teacher candidates studying in the lower-level class are closer the traditional conception while those studying in the upper-level classroom are more inclined to the constructivist conception (Aydın et al., 2015; Aypay, 2011; Bıkmaz 2017; Lamote & Engels, 2010; Löfström & Poom-Valickis, 2013). Pre-service teachers' starting teacher education programs with a high traditional view can be explained by the former educational experiences and practices that are based on teacher-centered and traditional approach (Bıkmaz, 2017). As their grade level increases, it is expected that they will be closer to the constructivist conception as a result of teaching and learning practices and experiences at the faculty (Aydın et al., 2015; Tang et al., 2012). The fact that pre-service teachers take courses related to field education, teaching professional knowledge and teaching practice in the third and fourth years of teacher education programs may also explain the significant difference between the averages (Löfström & Poom-Valickis, 2013; Tang et al., 2012). In this context, it can be implied that education and training activities at the faculty reduce students' belief in the effectiveness of traditional conceptions in learning and teaching (Aypay, 2011).

Overall, the findings of the current study are mostly in line with the previous studies regarding teaching and learning conceptions of teachers/pre-service teachers. Pre-service English language teachers' conceptions can give important clues in explaining their teaching behaviours in the future. In this context, it can be assumed that the result of the research is positive for pre-service English language teachers who will be the implementers of the program in the future. In light of the findings, it is suggested that English language education policy-makers, material designers and teacher educators should take into account of constructivist principles while designing teacher education programs. In addition, English language teacher educators should (1) promote pre-service teachers to think about, criticize, discuss and evaluate the practices they or other pre-service teachers prefer in applied and teaching practicum courses, (2) apply constructivist principles in the courses and employ student-centered teaching methods such as cooperative learning, project-based learning, problem-based learning and discussion (3) carry out activities which improve the critical thinking and reflective thinking skills of pre-service teachers, and (4) train teachers who can organize and manage constructivist learning environments for their students.

The present study is limited to the quantitative and self-reported data collected through a likert-type scale. The future studies can employ qualitative data collection techniques such as interviews, focus groups and observations. In addition, the same study can also be reiterated by adopting a mixed and longitudinal method through assessing the teaching and learning conceptions of the pre-service English language teachers in each grade level (1<sup>st</sup>- 4<sup>th</sup>) to determine the impact of English language teacher education practices more clearly. Moreover, the extent to which teachers/pre-service English language teachers are able to put their understanding into their teaching practices should also be investigated. Lastly, further studies can take this research as a starting point and explore the factors and previous experiences that shape the pre-service English language teachers' conceptions.

**Conflicts of Interest:** The author declares no conflict of interest.

**Funding Details:** No funding or grant was received from any institution or organization for this research.

**CRedit Author Statement:** Author1: Conceptualization, Methodology, Resources, Investigation, Supervision, Analysis, Writing-Review & Editing

**Ethical Statement:** Before data collection, necessary permissions were obtained from the faculty of Education to apply the TLCQ scale to the participants. Moreover, a consent form was taken from the participants stating that they participated in the study voluntarily. Participants were indicated that the collected data will be used only for scientific purposes and will not be shared with any third party or group other than for research purposes.

## REFERENCES

- Agola, E. (2004). Constructivist Versus Traditional Methods in Language Education. *Perspectives In Learning*, 5(1). 46-49.
- Al Muhaimed, S. A. (2013). *Task-based language teaching vs. traditional way of English language teaching in Saudi intermediate schools: A comparative study*. [Doctoral Dissertation, Kent State University].  
[https://etd.ohiolink.edu/apexprod/rws\\_etd/send\\_file/send?accession=kent1383257660&disposition=inline](https://etd.ohiolink.edu/apexprod/rws_etd/send_file/send?accession=kent1383257660&disposition=inline)
- Aljohani, M. (2017). Principles of “constructivism” in foreign language teaching. *Journal of Literature and Art Studies*, 7(1).



- Aydın, Ö., Tunca, N., & Alkın-Şahin, S. (2015). Investigation of pre-service science teachers' conceptions of teaching and learning in relation to some variables. *K. Ü. Kastamonu Eğitim Dergisi*, 23(3), 1331-1346.
- Aypay, A. (2011). The adaptation of the teaching-learning conceptions questionnaire and its relationships with epistemological beliefs. *Educational Sciences: Theory & Practice*, 11(1), 7-29.
- Baş, G. (2014). Evaluation of elementary teachers' teaching-learning conceptions from some variables. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, 22, 18-30.
- Baş, G., & Beyhan, Ö. (2013). Correlation between pre-service teachers' teaching-learning conceptions and their student control ideologies. *H. U. Journal of Education, Special issue* (1), 14-26.
- Bıkmaz, F. (2017). Öğretmen adaylarının öğretme-öğrenme anlayışları ve bilimsel epistemolojik inançlarının araştırılması: Boylamsal bir çalışma. *Eğitim ve Bilim*, 42(189), 183-196.
- Brooks, J. G., & Brooks, M. G. (1999). *In search of understanding: The case for constructivist classrooms* (Revised ed.). Alexandria, VA: Association for Supervision and Curriculum Development.
- Büyükduman, F. İ. (2005). The opinions of elementary school English teachers on the English curriculum for elementary schools. *H. U. Journal of Education*, 28, 55-64.
- Chan, K. W., & Elliott, R. G. (2004). Relational analysis of personal epistemology and conceptions about teaching and learning. *Teaching and Teacher Education*, 20, 817-831.
- Chan, K. W., Tan, J., & Khoo, A. (2007). Pre-service teachers' conceptions about teaching and learning: A closer look at Singapore cultural context. *Asia-Pacific Journal of Teacher Education*, 35(2), 181-195.
- Cheng, M. M. H., Chan, K-W., Tang, S. Y. F., & Cheng, A. Y. N. (2009). Pre-service teacher education students' epistemological beliefs and their conceptions of teaching. *Teaching and Teacher Education*, 25(2), 319-327.
- Christensen, L.B., Johnson, R.B., & Turner, L.A. (2015). *Research methods design and analysis*. (12th ed.). Pearson.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd ed.). Lawrence Erlbaum Associates.
- Crandall, J. (1997). Language teaching approaches for school-aged learners in second language contexts. In G. R. Tucker & D. Corson (Eds.), *Encyclopedia of language and education* (pp. 75-84). Kluwer Academic Publishers.
- Demircan, O. (1988). *Foreign language teaching in Turkey: Past to present*. Remzi.
- Demirel, O. (2003). *Foreign language teaching*. Pegem Publications.
- Dunlop, J. C., & Grabinger, R. S. (1996). Rich environments for the active learning in higher education. In G. B. Wilson, (Ed.), *Constructing learning environments: Case studies in instructional design* (pp. 65-82). Educational Technology Publications.

- Engin, G., & Daşdemir, İ. (2015). Evaluation of primary school teachers' teaching-learning conceptions with regards to different variables. *The Journal of Academic Social Science Studies*, 33, 425-432.
- Gül, A. (2016). *Constructivism as a new notion in English language education in Turkey* [Doctoral dissertation, Kent University]. <https://www-s3-live.kent.edu/s3fs-root/s3fs-public/file/Gul%20-%20Abstract.pdf>
- Güneş, H. & Karaazmak, F. (2017). Issues related to English language teaching at primary schools and suggested solutions. *The Journal of International Social Research*, 10(54), 731-737.
- Howard, B. C., McGee, S., Schwartz, N., & Purcell, S. (2000). The experience of constructivism: Transforming teacher epistemology. *Journal of Research on Computing in Education*, 32, 455-465.
- Kaufman, D. (2004). Constructivist issues in language learning and teaching. *Annual Review of Applied Linguistics*, 24, 303-319.
- Kavanoz, S. H. (2006). An exploratory study of English language teachers' beliefs, assumptions, and knowledge about learner-centeredness. *The Turkish Online Journal of Educational Technology*, 5(2), 3-9.
- Kırkgöz, Y. (2009). Globalization and English language policy in Turkey. *Educational Policy*, 23(5), 663-684.
- Lamote, C., & Engels, N. (2010). The development of student teachers' professional identity. *European Journal of Teacher Education*, 33(1), 3-18.
- Larsen-Freeman, D. (2000). *Techniques and principles in language teaching*. Oxford University Press.
- Lau, W. W. F. (2021). Predicting pre-service mathematics teachers' teaching and learning conceptions: The role of mathematical beliefs, mathematics self-efficacy, and mathematics teaching efficacy. *International Journal of Science and Mathematics Education*, 20, 1141-1160.
- Löfström, E., & Poom-Valickis, K. (2013). Beliefs about teaching: persistent or malleable? A longitudinal study of prospective teachers' beliefs. *Teaching and Teacher Education*, 35, 104-113.
- Mardiha, S. M., & Alibakhshi, G. (2020). Teachers' personal epistemological beliefs and their conceptions of teaching and learning: A correlational study. *Cogent Education*, 7(1).
- Marlowe, B. A., & Page, M. L. (2005). *Creating and sustaining the constructivist classroom* (2nd ed.). Corwin Press.
- Mayer, R. E. (2004). Should there be a three-strikes rule against pure discovery learning? *American Psychologist*, 59(1), 14-19.
- Nikitina, L. (2010). Addressing pedagogical dilemmas in a constructivist language learning experience. *Journal of the Scholarship of Teaching and Learning*, 10(2), 90-106.
- Nunan, D. (2000). *Language Teaching Methodology*. Longman.
- Oğuz, A. (2011). Öğretmen adaylarının demokratik değerleri ile öğretme ve öğrenme anlayışları. *Değerler Eğitimi Dergisi*, 9(22), 139-160.

- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Newbury House.
- Pallant, J. (2010). *SPSS Survival manual: A step by step guide to data analysis using SPSS*. (4th ed.). Open University Press.
- Piaget, J. (1973). *To understand is to invent*. The Viking Press.
- Prawat, R. S. (1992). Teachers beliefs about teaching and learning: a constructivist perspective. *American Journal of Education*, 100(3), 354–395.
- Reinfried, M. (2000). Can radical constructivism achieve a viable basis for foreign language teaching?- A refutation of the ‘Wolff-Wendt’ theorem. *Erfurt Electronic Studies in English*, Retrieved from [http://webdoc.gwdg.de/edoc/ia/eese/artic20/marcus/8\\_2000.html](http://webdoc.gwdg.de/edoc/ia/eese/artic20/marcus/8_2000.html)
- Richards, J. C., & Rodgers, T. S. (2007). *Approaches and methods in language teaching: A description and analysis*. Cambridge University Press.
- Schunk, D. H. (2008). *Learning theories: An educational perspective* (5th ed.). Pearson Education.
- Sengupta, A. (2015). Generating content through online collaborative writing: a study. In G. Pickering & P. Gunasheka (Eds.), *Innovation in English language teacher education: Selected papers from the fourth International teacher educator conference* (pp. 56-65). British Council.
- Senemoğlu, N. (2004). *Gelişim, öğrenme ve öğretim: Kuramdan uygulamaya* (10. baskı). Gazi Kitabevi.
- Şahan, H. H., & Terzi, A. R. (2015). Analyzing the relationship between prospective teachers’ educational philosophies and their teaching- learning approaches. *Educational Research and Reviews*, 10(8), 1267-1275.
- Şahin, S., & Yılmaz, H. (2011). A confirmatory factor analysis of the teaching and learning conceptions questionnaire (TLCQ). *Journal of Instructional Psychology*, 38(3), 194-200.
- Tang, S. Y. F., Wong, A. K. Y., & Cheng, M. M. H. (2012). Professional learning in initial teacher education: Vision in the constructivist conception of teaching and learning. *Journal of Education for Teaching: International Research and Pedagogy*, 38(4), 435-451.
- Tam, M. (2000). Constructivism, Instructional Design, and Technology: Implications for Transforming Distance Learning. *Educational Technology and Society*, 3(2).
- Turan, M. B. (2019). The relationship between university students' epistemological beliefs and teaching/learning conceptions. *International Journal of Progressive Education*, 15(1), 184-194.
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

## Teacher Leadership and Classroom Management: A Research on Preschool Teachers

**Rengin Zembat<sup>i</sup>**  
Maltepe University

**Hilal Yılmaz<sup>ii</sup>**  
Artvin Coruh University

**Şeyma Değirmenci<sup>iii</sup>**  
Muğla Sıtkı Koçman University

**Büşra Çelik<sup>iv</sup>**  
University of Health Sciences

### Abstract

In this research, it was aimed to determine the relationship between preschool teachers' leadership levels and classroom management skill levels and to examine these two variables according to the demographic characteristics of the teachers. This study was conducted with a survey model, one of the quantitative research methods. The study group of the research consisted of 190 preschool teachers working in preschool education institutions located in Ataşehir, Eyüp, Kağıthane and Üsküdar districts of Istanbul, which were selected by the convenience sampling method in the 2016-2017 academic year. "Teacher Leadership Scale" and "Classroom Management Skills Scale for Preschool Teachers" were used as data collection tools. As a result of the study, it was identified that there was a significant relationship between the leadership levels of preschool teachers and their levels of classroom management skill. The level of leadership of preschool teachers showed a significant difference according to the variables of age, choosing the profession willingly and the presence of assistant personnel in the classroom. Similarly, the classroom management skills of preschool teachers revealed a significant difference with regard to the variables of age and the presence of assistant personnel in the classroom.

**Keywords:** Preschool Teacher, Leadership, Classroom Management

**DOI:** 10.29329/ijpe.2023.534.7

**Submitted:** 26/12/2022

**Accepted:** 27/02/2023

**Published:** 01/04/2023

---

<sup>i</sup> **Rengin Zembat**, Prof. Dr., Preschool Education, Maltepe University, ORCID: 0000-0002-2377-8910

<sup>ii</sup> **Hilal Yılmaz**, Assist. Prof. Dr., Preschool Education, Artvin Coruh University, ORCID: 0000-0002-4594-3155

<sup>iii</sup> **Şeyma Değirmenci**, Dr., Preschool Education, Muğla Sıtkı Koçman Üniversitesi, ORCID: 0000-0001-7586-7483

<sup>iv</sup> **Büşra Çelik**, Assist. Prof. Dr., Child Development, University of Health Sciences, ORCID: 0000-0002-4954-7352

**Correspondence:** seymadegirmenci@mu.edu.tr

## INTRODUCTION

The concept of leadership is frequently encountered in recent years, especially in the field of education. The common aim of the studies emphasizing teacher leadership is to increase the quality of education and training activities. Another important concept of the education process is classroom management. Addressing both concepts in preschool education is very important for children and teachers.

When the literature is examined, many definitions of leadership are encountered. Bennis (1989) likened leadership to beauty and stated that it is difficult to define, but it will be recognized when seen. According to Marin M. Chermers (1997), leadership is the social interaction process that affects others while structuring the communication and activities within the social environment and the group (Turan, 2006).

In Turkish context, Koçel (2010) defines the leadership as the process of influencing and directing the activities of others in order to achieve certain personal or group objectives under certain circumstances. However, from a broader perspective, leadership can be defined as the whole knowledge and skills required to bring individuals together in a common ground to achieve specific goals (Eren, 1991).

The research on leadership demonstrate that the leader is not a product of a status or a position but social interaction. While the leader maintains group norms and develops positive emotions for group activities and group members, he/she may have different styles, such as democratic or authoritarian (Erdoğan, 2010). Leadership in all these different styles is manifested at every stage of life (Gökçek, 2007).

Studies conducted on leadership in schools and in various educational institutions generally refer to leadership as a movement and action by certain individuals. However, the leadership in schools is the sum of the transactions carried out in order to ensure the survival, development and effectiveness of the institution (Karip, 1998). Therefore, one of the strategies that teachers should implement for leadership development is to maintain their leadership role both inside and outside the classroom. The second strategy is to develop leadership qualities by sharing various experiences with colleagues. The third strategy is to see the positive aspects that exist in their colleagues and transfer them to themselves. The final strategy is that teachers should participate in management-oriented programs to improve their leadership skills (Can, 2014). The school, where teachers develop and implement these strategies, is also the centre of student-teacher interaction.

For an effective teaching-learning process, it is necessary to establish a special relationship between teacher and the students through a bond or bridge (Gordon, 1993). The management of the class, where this bond will be formed, is extremely important. According to Manning and Bucher (2013), class management covers the strategies to ensure the safety of the classroom, the methods and techniques that allow students to regulate their behaviours and to ensure self-discipline, and all methods and techniques that ensure the execution of the entire process in class in an organized way.

In this context, the first objective of class management is to create a regular and safe environment in order to increase the motivation of the students in the classroom. The second objective is to give responsibility to students by this way to develop this awareness and to teach students to organize their own behaviour. These objectives can only be possible through effective classroom management and creating an appropriate educational environment in classrooms where these targeted behaviours are observed (Korkut & Babaoğlu, 2010).

According to Martin and Baldwin (1997), class management is a three-dimensional structure that encompasses individuals, teaching activities and class discipline. In the first dimension which refers to individuals, the expectations of teachers from students, their attitudes and behaviours towards them and the level of students' achievement are included (as cited in Denizel et al., 2005). On the

other hand, the planning activities, organizing the educational environment and time management are included within the scope of the teaching activities (as cited in Denizel et al., 2005). Discipline which is the last dimension includes the methods used by teachers for students learning the classroom rules and the implementation of them in the class (as cited in Denizel et al., 2005). After the above-mentioned understanding of the importance of classroom management, 'classroom management' has been involved in the program as a compulsory course since the end of the 1990s in education faculties in Turkey (Şişman & Turan, 2004). In 1997, 'classroom management' has been involved in the program as a compulsory course in 16 undergraduate teaching program in the faculties restructured by the Council of Higher Education/YÖK.. In this way, the field of classroom management has attracted attention and new studies have emerged (Turan, 2006).

With this interest, preschool period began to be included in the gradually increasing number of the studies. One of the recent studies in this area was conducted by Toran and Gençgel (2016). In this study it is determined that teachers' classroom management skills did not differ in terms of variables such as gender, in-service training, age group and number of children in the classroom. On the other hand, it differed in terms of educational status, undergraduate degree, and professional experience in the context of the study on assessment of classroom management skills of preschool teachers.

Studies show that effective classroom management strategies increase children's eagerness to learn, their academic skills, and school readiness while ineffective classroom management strategies reduce the motivation of children and have negative effects such as increasing disruptive behaviour problems (Webster-Stratton, Reinke, Herman, & Newcomer, 2011). On the other hand, it is not possible to talk about a single management strategy that will work for each student and class. The teacher's responsibility is to decide which strategy should be applied in which cases and which is better, and to apply different strategies when necessary (Oliver, & Reschly, 2007). It is clear that teachers who are expected to adopt different strategies in different groups should be a good leader.

The characteristics of the teacher who is the director of the classroom management and the creator of the classroom climate have a significant effect on the quality of the classroom management (Yüksel, 2013). Teacher leadership, which is one of these characteristics, is also considered as one of the important factors for quality and effectiveness in modern schools (Ho and Tilky, 2012; Sims et al, 2015). Teacher leadership is the ability to organize activities in the classroom in accordance with the students' level of development, to ensure the active participation of students and to direct them to learn (Can, 2014).

Teachers who want to make the teaching-learning process more effective must have the ability to manage the students and the materials in their classrooms for teaching purposes (Demirtaş, 2009). This ability is that the teacher takes the lead in classroom management. The teachers with this ability are good in guidance, they are helpful, gentle, and understanding. Additionally, they are aware of the responsibilities and freedom of students and they allow students to go in their own path (Balci, 2013). Accordingly, the teacher who is the leader in his class takes a crucial part in classroom management. In this respect, in order for the classroom management to be fully realized, teachers need to develop their managerial skills as well as their educational skills (Demirtaş, 2009).

Since effective teacher leaders believe that it is not right to take all the information and decisions themselves, they increase the effectiveness of their students and leave them in the role of a leader in teaching learning strategies. These teachers are expected to be a leader teacher who directs their own development and the development of their colleagues in this direction, while effectively performing classroom management for student learning (Akgün, 2001).

The task of the teacher who is the leader in his class is to produce strategies that provide positive development and provide effective teacher-student communication (Aydın, 2014).

Although there are some studies conducted in this field it can be said that these studies are inadequate. In a study conducted by Şara, Karadedeli and Hasanoğlu (2016), it was introduced as a

proof of inadequacy of these studies. In this study, it was aimed to examine the articles about class management scanned in ULAKBIM database between 2010 and 2015. One of this study's findings revealed that among the 59 articles published in 5 years, the participants of only 3 of these studies were preschool teachers.

It is known that teachers' leadership skills are necessary for classroom management (Atman, 2010; Cubukcu & Girmen, 2008; Hersey, Angelini, & Carakushansky, 1982). The literature indicates that the studies focusing on the relationship between leadership and classroom management skills of preschool teachers are scarce, especially. There is a study carried out only with secondary school teachers in this field (Kızılkaya, 2017). Determining the leadership and classroom management skills of preschool teachers is considered important in terms of improving the quality of the education and teaching process. In this respect, the current study aims to contribute this issue. For this purpose, answers to the following questions were sought:

1. Are the levels of preschool teachers' leadership and classroom management skills significantly differentiated according to their demographic characteristics (age, education level, professional seniority, voluntary selection of the profession and presence of assistant personnel in the classroom)?

2. Is there a significant relationship between the leadership levels of preschool teachers and their levels of classroom management skills?

## METHOD

### Research Design

In this study, the relational survey model of quantitative research methods was used to examine the relationship between the leadership and classroom management skill levels of preschool teachers. Although this model does not reveal the exact cause-effect relationship, it is possible to predict the other if one of the variables is known (Karasar, 2000). Since the present study mainly examines preschool teacher' leadership levels and classroom management skills, correlational research design has been chosen to reveal the relationship network among the research variables.

### Study Group

The study group of the research was formed by the convenience sampling method from non-probability sampling methods. Within the scope of this research, the number of participants in the study group was determined according to the opinion of Stevens (1996), and it was deemed appropriate to select 5-20 people per item in the measurement tool (as cited in Erkuş, 2016). The study group of the research consists of 190 preschool teachers working in preschool education institutions in Ataşehir, Eyüp, Kağıthane and Üsküdar districts of Istanbul in the 2016-2017 academic year. The demographic characteristics of participants were shown in Table 1.

**Table 1** Demographic Characteristics of the Participants

Variables	<i>f</i>	%
Age		
21-25	48	25.3
26-30	107	56.3
31 and above	35	18.4
Education Status		
Associate degree	51	26.8
Undergraduate	122	64.2
Post graduate	17	8.9
Professional Seniority		
0-5	123	64.7
6 years and above	67	35.3

Voluntary Selection of Profession		
It is my own accord	174	91.6
It is not my own accord	16	8.4
Status of Availability of Assistant Staff in the Classroom		
Available	42	22.1
Not available	148	77.9

Table 1 shows 107 (56.3%) of the teachers participating in the research are between the ages of 26-30. 122 (64.2%) of them are undergraduate graduates. 123 (64.7%) of them have 0-5 years of professional seniority. 174 (91.6%) chose their profession voluntarily. 148 (77.9%) of them do not have assistant staff.

### Data Collection Tools

**Teacher leadership scale.** The leadership scale developed by Beycioğlu and Aslan (2010) aims to describe teachers' perceptions and expectations of teacher leadership. There is a total of 25 items with five-point Likert scale (5 = Always, 1 = Never). The range of scores that can be taken from the scale varies among 25 to 125. Higher scores obtained from the scale indicate that the perception and expectation of teacher leadership was high; low scores indicate that the perception and expectation of teacher leadership is low. The scale consists of three factors: "Institutional development", "Professional development", "Cooperation with colleagues". The Cronbach-alpha internal consistency coefficient of the scale is ".93" for expectations, ".95" for the perception" (Beycioğlu, & Aslan, 2010). The total internal consistency coefficient of the scale was calculated as .92.

**Classroom management skills scale for preschool teachers.** The scale was developed by Dinçer and Akgün (2015) in order to determine the classroom management skills of preschool teachers according to their own perceptions. The scale consisting of 40 items, with 5-point Likert scale (5= totally defining, 1= not defining). The highest score obtained from the scale is considered to be positive for the classroom management skills. The scale consists of two sub-dimensions: "Professional skills" and "Teacher child interaction" (Dinçer and Akgün, 2015). The scale consists of two sub-dimensions: "Professional skills" and "Teacher child interaction". The internal consistency coefficients of the scale were as follows (Cronbach  $\alpha$ ) .83, .88 and .70; test-retest reliability coefficients. 91, .87 and .83. (Dinçer and Akgün, 2015). The total internal consistency coefficient of the scale was calculated as .94.

### Data Collection and Analysis

In the process of data collection, firstly permission was obtained from Istanbul Provincial Directorate of National Education, then the preschool education institutions were visited and after obtaining the necessary permission from the school principals, the survey was conducted. The forms were given to the teachers in the study group and the forms were collected after completed.

During the analysis, the descriptive frequency and percentage distributions were measured for the calculation of independent variables, and then the group distributions were examined and parametric techniques were used for those with normal distribution, and nonparametric techniques were used for those who did not have normal distribution. When determining whether the groups show normal distribution, it is taken into consideration whether the group size is greater than 30 (Baykul and Güzeller, 2016; Büyüköztürk, Çokluk and Köklü, 2017). Parametric techniques were used for independent variables with group numbers greater than 30, and non-parametric techniques for those less than 30. Parametric analyzes were applied due to the homogeneity of the distribution of the data, as can be seen in Table 2 (Creswell, 2008).



**Table 2.** One-Sample Kolmogorov-Smirnov Test

		Leadership Scale	Classroom Management Skills Scale
N		190	190
Normal Parameters	Mean	106,71	153,99
	Std. Deviation	13,921	15,923
Most Extreme Differences	Absolute	,151	,147
	Positive	,110	,123
	Negative	-,151	-,147
Kolmogorov-Smirnov Z		2,075	2,023
Asymp. Sig. (2-tailed)		,000	,001

In this study, preschool teachers' leadership and classroom management skill levels were examined with regard to several variables. A Kruskal Wallis-H Test was used to illustrate the differentiation of preschool teachers' leadership and classroom management skill levels according to the professional seniority. An independent group t test was employed to show the differentiation of preschool teachers' leadership and classroom management skill levels according to the willingness to choose the profession. A Mann Whitney-U Test was utilized to reveal the differentiation according to the presence of assistants in the classroom. Finally, a Pearson Product Moment Correlation Coefficient Analysis was used to determine the relationship between Preschool teachers' leadership and classroom management skill levels. The data were analyzed in the appropriate statistical package program (SPSS 21) and the significance level was evaluated as .05.

## RESULTS

In this section, the findings of the leadership levels of preschool teachers and classroom management skills are examined.

**Table 3** Pearson Product Moment Correlation Coefficient Results Related to the Relationship between Teacher Leadership Scale and Classroom Management Skills Scale for Preschool Teachers

Score	N	r	p
Teacher Leadership Scale			
Classroom Management Skills Scale for Preschool Teachers	190	.596	.000***

\*\*\*p<.001

In Table 3, it is clear that there was a moderate significant relationship in a positive way ( $p < .001$ ,  $r = .60$ ) between the mean scores of the teacher leadership scale and the classroom management skills scale for preschool teachers. Accordingly, it can be said that if the leadership levels of preschool teachers increase, the classroom management skills also increase.

**Table 4** ANOVA Results Related to the Age Variable (N=190)

Variable	Group	n	$\bar{X}$	ss		Sum of Squares	df	Mean of Square	F	p
Teacher Leadership Scale	21-25	48	115.10	9.110	Between Group	5191.203	2	2595.601	15.439	.000***
	26-30	107	105.11	14.803	Within Group	31437.876	187	168.117		
	31 and above	35	100.09	11.257	Total	36629.079	189			
Classroom Management Skills Scale	21-25	48	167.96	22.282	Between Group	7964.145	2	3982.073		
	26-30	107	153.90	21.419	Within Group	78242.929	187	418.411	9.517	.000***
	31 and above	35	165.29	13.585	Total	86207.074	189			

\*\*\*p<.001

In Table 4, it is seen that the scores of the Teacher Leadership Scale and the Classroom Management Skills Scale for Preschool Teachers differ significantly according to the age variable as a result of ANOVA. According to this result, a significant difference was found between the mean scores of the groups. The groups were compared with each other in order to determine which groups have these differences. As it was determined that there was not a homogeneous distribution of variance, the Tamhane Test was performed and the test results are presented in Table 5.

**Table 5** The Results of the Tamhane Test (N=190)

Scores	(I) Age	(J) Age	Mean Difference (I-J)	<i>p</i>
Teacher Leadership Scale	21-25	26-30	9.992	.000***
		31 and above	15.018	.000***
	26-30	21-25	-9.992	.000***
		31 and above	5.026	.110
	31 and above	21-25	-15.018	.000***
		26-30	-5.026	.110
Classroom Management Skills Scale	21-25	26-30	14.061	.001**
		31 and above	2.673	.876
	26-30	21-25	-14.061	.001**
		31 and above	-11.389	.001**
	31 and above	21-25	-2.673	.876
		26-30	11.389	.001**

\*\*\* $p < .001$ , \*\* $p < .01$

Table 5 indicates that the 21-25 year-old teachers reported higher teacher leadership orientation compared to 26-30 year-olds. Similarly, the difference between 21-25 year-old and 31+ year-old teachers was statistically significant and was in favour of 21-25 year-olds. The difference between other groups was not statistically significant ( $p > .05$ ).

With regard to Classroom Management Skills Scale for Preschool Teachers, the statically significant difference between 21-25 year-old and 26-30 year-old teachers was in favor of 21-25 year-olds. However, the statically significant difference between 21-25 year-old and 31+ year-old teachers was in favor of 31+ year-olds. The difference between other groups was not statistically significant ( $p > .05$ ).

The findings regarding the differentiation status of the scores of preschool teachers from the scales according to the education status variable are shown in Table 6.

**Table 6** Kruskal Wallis-H Test Results (N=190)

Scores	Groups	<i>n</i>	Mean Rank	$\chi^2$	<i>Sd</i>	<i>p</i>
Teacher Leadership Scale	Associate degree	51	89.02	4.587	2	.101
	Undergraduate	122	94.57			
	Post Graduate	17	121.62			
Classroom Management Skills Scale for Preschool Teachers	Associate degree	51	81.22	4.717	2	.095
	Undergraduate	122	100.91			
	Post graduate	17	99.50			

In Table 6, when the results of the Kruskal Wallis-H test which was conducted to determine whether there was a significant difference between the teacher leadership scale scores of the preschool teachers and the classroom management skills scale scores for preschool teachers were analyzed, it was determined that the difference between the mean of the groups was not statistically significant ( $p > .05$ ).

**Table 7** Independent Group t Test Results Related to the Professional Seniority Variable (N=190)

Score	Professional Seniority	N	$\bar{X}$	Ss	t Test		
					t	Sd	p
Teacher Leadership Scale	0-5	123	107.61	14.543	1.20	188	.229
	6 years and over	67	105.06	12.641	8		
Classroom Management Skills Scale for Preschool Teachers	0-5	123	159.19	22.686	-.314	188	.754
	6 years and over	67	160.21	18.819			

When Table 7 is examined, no significant difference was found between the arithmetic averages of the scores received by the preschool teachers who participated in the study according to the professional seniority variable ( $p > .05$ ).

**Table 8** Mann Whitney-U Test Results Related to the Voluntary Selection of Profession (N=190)

Score	Voluntary Selection of Profession	N	Mean Rank	Sum of ranks	U	z	p
Teacher Leadership Scale	It is my own choice	174	98.07	17064.50	944.500	-2.128	.033*
	It is not my own choice	16	67.53	1080.50			
Classroom Management Skills Scale for Preschool Teachers	It is my own choice	174	97.72	17002.50	1006.500	-1.832	.067
	It is not my own choice	16	71.41	1142.50			

\* $p < .05$

In Table 8, Mann Whitney-U test results indicated that the difference between the mean rank of the groups was significant ( $z = -2.128$ ;  $p < .05$ ). This difference was realized in favor of teachers who chose their profession on a voluntary basis. On the other hand, no significant difference was found between the scores obtained from the Classroom Management Skills Scale for Preschool Teachers. In Table 9 independent t Test results related to the status of availability of assistant staff were given.

**Table 9** Independent t Test Results Related to the Status of Availability of Assistant Staff (N=190)

Score	Status of Availability of Assistant Staff	N	$\bar{X}$	Ss	t Test		
					t	Sd	p
Teacher Leadership Scale	Available	42	115.86	11.671	5.138	188	.000***
	Not Available	148	104.11	13.435			
Classroom Management Skills Scale for Preschool Teachers	Available	42	180.31	17.198	8.331	188	.000***
	Not Available	148	153.66	18.597			

\*\*\* $p < .001$

As a result of the independent group t test it is seen the significant differences in terms of the status of availability of assistant staff in the classroom variable. The mean scores indicated that the difference between the groups in favor of the teachers who have assistant staff in the classroom ( $p < .001$ )

## DISCUSSION AND CONCLUSION

It is known that it is very important for teachers to include their teacher leadership skills in the classroom management process for an effective learning to take place. As a result of this research, which was carried out based on this information, it was found that there was significant relationship at a moderate level and positive way between the leadership levels of preschool teachers and classroom management skills. It can be said that as the leadership levels of teachers increase, classroom management skill levels increase. Preschool teachers lead children in their classes and staff in their institutions. They direct the work done in their schools. While doing all these, they use both management skills and leadership skills (Tal, 2010). Classes are the most important application areas of teachers' plans and programs. Classes are also the most critical units where the teacher will realize the objectives related to the curriculum, reflect the teaching ideas and behaviors, and show the leadership characteristics.

As a leader in the classroom, the teacher will manage the whole process of classroom management (Can, 2014). Teacher leadership will support the quality of the institution along with classroom management skills (Mettiäinen, 2016). Establishing a positive classroom climate, organizing the education environment in a manner to provide desired behaviors, taking measures to address the problems that may arise or solving existing problems with appropriate methods are considered within the scope of teacher leadership (Çubukçu, & Girmen, 2008). In the literature, it has been concluded that there is a positive and significant relationship between the leadership styles and classroom management behaviors of physical education teachers (Çelik, 2014), and primary school teachers (Kadak, 2008). On the other hand, Memişoğlu and Çakır (2015) revealed in their research that there is a significant relationship between leadership styles and classroom teacher behaviors. Preschool teachers are expected to achieve more effective classroom management skills through the development of leadership levels. Thus, undesired behaviours in the classroom and classroom management disruptions that adversely affect the learning process will be prevented.

As a result of the research, the skill levels of the preschool teachers' leadership and classroom management indicated significant difference according to age. The level of leadership of teachers in the 21-25 age group was higher than in other teachers. Teachers new to the profession as they start their career with great excitement and enthusiasm aim to be a role model for their students (Korkmaz, Saban, & Akbasli, 2004). On the other hand, some studies done with preschool teachers (Akçadağ, 2008), physical education teachers (Çelik, 2014), preschool administrators and teachers (Dikmen Ada, 2012) and elementary school teachers (Kadak, 2008) have concluded that the leadership behaviors of teachers do not differ according to age variable. It is thought that the branch they study in may be effective in the high leadership skills of young teachers. As a matter of fact, as a result of the research conducted by İbiş and Çalışkan (2021), in which they examined the leadership skills of different branch teachers, it was revealed that preschool teachers had the highest score (İbiş and Çalışkan, 2021).

With regard to the level of classroom management skills of preschool teachers, the statically significant difference between 21-25 year-old and 26-30 year-old teachers was in favor of 21-25 year-olds and difference between 26-30 year-old and 30+ year-old teachers was in favor of 31+ year-olds. The high level of classroom management skills of teachers between the ages of 21 and 25 may be related to their personal development. In addition, it is clear that, as the age group of teachers increases, classroom management skill levels increase as well (Dinçer, & Akgün, 2015; Ilgar, 2007; Sönmez, 2014). On the other hand, there are also studies that indicate no differentiation between classroom management skills and age (Alatlı, 2014; Çevik Karatekin, 2018; Düzgün, 2016; Nur, 2012; Yaşar Ekici, Günhan, & Anılan, 2017).

According to the results of this study, the skill levels of the preschool teachers' leadership and classroom management do not differ according to the educational status. At this point, it is important how teachers use their personal competencies and classroom management regardless of their education level. Li (2015) obtained a similar finding in his study. Kadak (2008) studied with teachers working in primary schools and Dikmen Ada (2012) studied with the leadership behaviors of preschool administrators and teachers and these studies revealed that the leadership behavior of these teachers did not differ according to the educational status. In studies examining classroom management skills, similar to this research finding, it was found that classroom management skills of preschool teachers (Nur, 2012; Yaşar Ekici et al., 2017) and secondary school teachers (Düzgün, 2016) do not differ according to their educational status. On the other hand, there are research findings indicating that as the educational status of preschool teachers increases, their classroom management skills increase (Ata, 2014) and that classroom management skills of teachers at different levels differ according to their educational status (Kızılkaya, 2017; Sadık and Dikici Sığırtmaç, 2016; Toran and Gençgel). When these research findings are evaluated together with the findings in the literature, it can be said that qualitative research findings are needed in order to reveal concrete findings on the effect of the educational status variable on leadership and classroom management skills.

According to another result of the study, preschool teachers' leadership and classroom management skill levels do not differ according to the professional seniority variable. Li (2015) determined that leadership behaviors of preschool teachers did not differ according to the seniority. Kk and Bektař (2010) found that the leadership styles of teachers working in secondary education did not differ according to the professional seniority variable. On the other hand, there are also studies that determined that the leadership skills of teachers differ according to professional seniority (Dikmen Ada, 2012; Memiřođlu, & akır 2015). As a result of this research, the reason why teachers' leadership and classroom management skills do not differ according to professional seniority variable can be examined in detail. Contrary to expectations, the result of such a result can be interpreted as teachers acquiring these skills from different sources.

Classroom management skill levels of preschool teachers do not differ according to the professional seniority variable. Adıgzel (2016), Denizel Gven and Cevher (2005), Keleř (2013) and Nur (2012) concluded that the classroom management skills of preschool teachers did not differ according to the professional seniority variable. Special education teachers' (Alatlı, 2014) and physical education teachers' (elik, 2014) classroom management skills did not differ according to their seniority. On the other hand, there are also studies that found that teachers' classroom management skills differ according to professional seniority (Akın, 2006; Ata, 2014; Sadık, & Dikici Sıđırtma, 2016; Yařar Ekici, Gnhan, & Anılan, 2017).

As a result of the study, it was determined that the level of leadership of preschool teachers who chose the profession willingly was higher than the other teachers. No matter which profession, the attitude towards that profession will affect the work done. The best example of this is the teaching profession. Teachers who enjoy doing their job are successful in that field (Purchase, & Bekdemir, 2006). The teacher who fulfills his profession willingly is the one who trusts and respects his students, makes learning valuable and enjoyable and loves his job (zdemir, Yalın, & Sezgin, 2004). These teachers will complete their personal development and present a good model for their students.

Classroom management skill levels of preschool teachers did not differ according to the status of choosing the profession willingly. What is important in classroom management is that the teacher prevents the undesired behaviors in the classroom based on previous experiences and lives. On the other hand, Adıgzel (2016) found that the preschool teachers who chose their profession willingly had higher levels of classroom management skills.

As a result of the study, it was determined that the skill levels of the leadership and classroom management of the preschool teachers differed significantly according to the status of availability of assistant staff in the classroom variable. The scores of the teachers who have assistant staff in the classroom are higher than the other teachers. The presence of assistant staff in the classroom enables the effective execution of the education process (Gndz, 2012) and allows teachers to spend more time with the children in the process of activity. Thus, the teacher can have the opportunity to lead children and to provide classroom management effectively. In this regard, ınar Terbilliođlu (2015) and evik Karatekin (2018) found that preschool teachers who had assistant staff in their classes had higher perceptions about psychological empowerment levels in personal freedom and impact dimensions than other teachers. Heikka, Halttunen, and Waniganayake (2018) stated that the leadership of teachers and employees in preschool institutions in Finland was shared among teachers, administrative staff and assistants. Thus, the success of the institution was increasing. Teachers' communication with the assistant staff in the classroom (Yılmaz and Aslan, 2013) provides teachers convenience in classroom management.

### **Implications**

Based on these results, the following suggestions for the researchers and practitioners were introduced: As a result of this research, a relationship was found between the leadership skills of preschool teachers and their classroom management skills. It is recommended to conduct research with different socio-cultural participant groups, using qualitative research methods for the reasons for this

relationship. In this study, a detailed examination can be made about the reasons why teachers aged 21-25 have higher leadership skills. The possible reasons for the high leadership skills of the teachers who choose their profession voluntarily can be examined by interviewing the teachers. By supporting young candidates in the career selection process, the interest in the teaching profession can be increased, so that individuals who become teachers by wanting the profession can be more effective. Finally, since the situation of having assistant personnel in the classroom is positive on both leadership skills and classroom management skills, studies on having assistant personnel in each teacher's classroom in preschool education institutions can be carried out by authorized institutions.

**Conflicts of Interest:** The authors declare no potential conflict of interest in this study.

**Funding Details:** No funding or grant was received from any institution or organization for this research.

**CRedit Author Statement:** Rengin Zembat: Supervision, Writing-Review & Editing. Hilal Yılmaz: Investigation Visualization, Writing- Original draft preparation. Şeyma Değirmenci: Conceptualization, Methodology, Writing- Original draft preparation. Büşra Çelik: Data Curation, Visualization, Writing- Reviewing and Editing.

**Ethical Statement:** This article is the authors' own original work, which has not been previously published elsewhere. The article is in compliance with the ethical principles page of the journal.

## REFERENCES

- Adıgüzel, İ. (2016). *Okul öncesi öğretmenlerinin sınıf yönetimi becerileri ile tükenmişlik düzeyleri arasındaki ilişki* (Yayımlanmamış yüksek lisans tezi). Recep Tayyip Erdoğan Üniversitesi, Rize.
- Akçadağ, S. (2008). *Okul öncesi öğretmenlerinin liderlik davranışları ve kişilik özellikleri arasındaki ilişkinin çeşitli değişkenlere göre incelenmesi* (Ankara ili örneği) (Yayımlanmamış yüksek lisans tezi). Gazi Üniversitesi, Ankara.
- Akın, U. (2006). *Öğretmenlerin sınıf yönetimi becerileri ile iş doyumları arasındaki ilişki* (Yayımlanmamış yüksek lisans tezi). Gaziosmanpaşa Üniversitesi, Tokat.
- Akgün, N. (2001). *İlköğretim okulu müdürlerinin öğretimsel liderliği* (Yayımlanmamış doktora tezi). Abant İzzet Baysal Üniversitesi, Bolu.
- Alatlı, R. (2014). *Genel ve özel eğitim öğretmenlerinin sınıf yönetimi bilgileri ile sınıf yönetimine ilişkin öz yeterliklerinin karşılaştırılması* (Yayımlanmamış yüksek lisans tezi). Ankara Üniversitesi, Ankara.
- Alım, M., & Bekdemir, Ü. (2006). Coğrafya öğretmeni adaylarının öğretmenlik mesleğine yönelik tutumları. *Milli Eğitim Dergisi*, 172, 263-275.
- Ata, S. (2014). *Okul öncesi öğretmenlerde bağlanma ve sınıf yönetimi profillerinin anne bağlanması ve çocuk yetiştirme tutumlarıyla ilişkilerinin incelenmesi* (Yayımlanmamış doktora tezi). Hacettepe Üniversitesi, Ankara.
- Atman, R. B. (2010). *Öğretmenlerin liderlik niteliklerinin sınıf yönetme becerilerine etkisi* (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.
- Aydın, A. (2014). *Sınıf yönetimi*. Ankara: Pegem.
- Baykul Y., & Güzeller C. O. (2016). *Sosyal bilimler için istatistik SPSS uygulamalı*. Ankara: Pegem.

- Bennis, W. G. (1989). *On becoming a leader*. MA: Addison-Wesley.
- Buckner, K. G., & McDowelle, J. O. (2000). Developing teacher leaders: providing encouragement, opportunities, and support. *NASSP Bulletin*, 84(616), 35-41. doi: 10.1177/019263650008461607.
- Büyüköztürk, Ş., Çokluk, Ö., & Köklü, N. (2017). *Sosyal bilimler için istatistik*. Ankara: Pegem.
- Can, N. (2009). Öğretmenlerin sınıfta ve okulda liderlik davranışları. *Gaziantep Üniversitesi Sosyal Bilimler Dergisi*, 8(2), 385-399.
- Can, N. (2014). *Öğretmen liderliği*. Ankara: Pegem.
- Carlson, J. S., Tired, H. B., Bender, S. L., & Benson, L. (2011). The influence of group training in the Incredible Years Teacher Classroom Management Program on preschool teachers' classroom management strategies. *Journal of Applied School Psychology*, 27(2), 134-154. doi: <https://doi.org/10.1080/15377903.2011.565277>
- Creswell, J. W. (2008). *Research design: qualitative, quantitative, and mixed methods approaches*. Sage.
- Çelik, O. B. (2014). *Farklı liderlik stillerine sahip olan beden eğitimi öğretmenlerinin sınıf yönetimi davranışlarının incelenmesi* (Yayımlanmamış yüksek lisans tezi). Gazi Üniversitesi, Ankara.
- Çevik Karatekin, K. N. (2018). *Okul öncesi öğretmenlerinin iletişim becerileri ile sınıf yönetimi becerileri arasındaki ilişkinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.
- Chemmers, M. M. (1997). *An integrative theory of leadership*. Mahwah, NJ: Erlbaum.
- Çınar Terbillioğlu, Ö. (2015). *Öğretmenler psikolojik olarak kendilerini güçlü hissediyorlar mı?* (Yayımlanmamış yüksek lisans tezi). Pamukkale Üniversitesi, Denizli.
- Çubukçu, Z., & Girmen, P. (2008). Öğretmenlerin sınıf yönetimi becerilerine ilişkin görüşleri. *Bilgi (Türk Dünyası Sosyal Bilimler Dergisi)*, 44, 123-142.
- Demirtaş, H. (2009). Sınıf yönetiminin temelleri. H. Kıran (Ed.), *Sınıf yönetimi* (ss. 1-34). Ankara: Anı Yayınları.
- Denizel Güven, E., & Cevher, F. N. (2005). Okul öncesi öğretmenlerinin sınıf yönetimi becerilerinin çeşitli değişkenler açısından incelenmesi. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 18(1), 71-92.
- Dikmen Ada, B. (2012). *Yaratıcı Liderlik Ölçeğinin geliştirilmesi ve okul öncesi yönetici ve öğretmenlerinin yaratıcı liderlik özelliklerinin incelenmesi* (Yayımlanmamış doktora tezi). Marmara Üniversitesi, İstanbul.
- Drang, D. M. (2011). Preschool teachers' beliefs, knowledge, and practices related to classroom management. Doctoral dissertation. University of Maryland, USA.
- Düzgün, O. (2016). *Ortaokulda görev yapmakta olan öğretmenlerin mutluluk düzeyleri ile sınıf yönetimi becerileri arasındaki ilişki* (Yayımlanmamış yüksek lisans tezi). Gaziosmanpaşa Üniversitesi, Tokat.
- Erdoğan, İ. (2010). *Eğitim ve okul yönetimi okul yöneticileri ve öğretmenlerle ilgilenen tüm eğitimciler için*. İstanbul: Alfa Yayınları.

- Eren, E. (1991). *Örgütsel davranış ve yönetim psikolojisi*. İstanbul: Beta Yayınları.
- Erkuş, A. (2016). *Psikolojide ölçme ve ölçek geliştirme-I: Temel kavramlar ve işlemler*. Pegem Akademi.
- Fonsén, E., & Ukkonen-Mikkola, T. (2019). Early childhood education teachers' professional development towards pedagogical leadership. *Educational Research*, 61(2), 181-196. doi: <https://doi.org/10.1080/00131881.2019.1600377>
- Gökçek, B. S. (2007). *Beş-altı yaş çocuklar için hazırlanan karakter eğitimi programının etkisinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.
- Gordon, T. (1993). *Etkili öğretmenlik eğitimi* (E. Aksay, & B. Özkan, Çev.). İstanbul: YA-PA.
- Gözcü Yaprak, G. (2019). *Okul öncesi öğretmenleri ve öğretmen adaylarının sınıf yönetimi tutum ve inançları ile empati eğilim düzeyleri arasındaki ilişkinin çeşitli değişkenler açısından incelenmesi* (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.
- Gün, P. (2012). *Okul öncesi öğretmenlerinin duygusal zekâ yeterlikleri ile öğretimsel liderlik davranışları arasındaki ilişkinin incelenmesi: Gaziantep ili örneği* (Yayımlanmamış yüksek lisans tezi). Gaziantep Üniversitesi, Gaziantep.
- Gündüz, Y. (2012). Eğitim örgütlerinde denetimin gerekliliği: Kuramsal bir çalışma. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, 34, 1-6.
- Heikka, J., Halttunen, L., & Waniganayake, M. (2018). Perceptions of early childhood education professionals on teacher leadership in Finland. *Early Child Development and Care*, 188(2) 143-156. doi: 10.1080/03004430.2016.1207066.
- Hersey, P., Angelini, A. L., & Carakushansky, S. (1982). The impact of situational leadership and classroom structure on learning effectiveness. *Group & Organization Studies*, 7(2), 216-224. doi: <https://doi.org/10.1177/105960118200700209>
- Ho, D., Tilky, L. P. (2012) Conceptualizing teacher leadership in a Chinese, policy-driven context: a research agenda, *School Effectiveness and School Improvement*, 23:4, 401-416, DOI: 10.1080/09243453.2012.678861
- İbiş, Y., & Çalışkan, Ö. (2021). Öğretmenlerin liderlik rollerine ilişkin algı ve beklentilerinin incelenmesi. *Milli Eğitim Dergisi*, 50 (230), 423-444.
- İlçi Küsmüş, G. (2018). *Okul öncesi öğretmenlerinin sınıf yönetimi becerileri ile mesleki profesyonellikleri arasındaki ilişkinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.
- İlgar, L. (2007). *İlköğretim öğretmenlerinin sınıf yönetimi becerileri üzerine bir araştırma* (Yayımlanmamış doktora tezi). İstanbul Üniversitesi, İstanbul.
- Kadak, Z. (2008). *İlköğretim okullarında görev yapan öğretmenlerin liderlik stilleri ile sınıf yönetimi arasındaki ilişkinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). Yeditepe Üniversitesi, İstanbul.
- Kaplan, Z. (2018). *Okul öncesi öğretmenleri sınıf yönetimi becerileri ölçeğinin geliştirilmesi ve öğretmenlerin sınıf yönetimi becerilerinin incelenmesi*. (Yayımlanmamış yüksek lisans tezi). İstanbul Üniversitesi, İstanbul.



- Karakaya, G. (2019). *Okul öncesi öğretmenlerinin sınıf yönetimi becerileri ile kaynaştırma öğrencilerinin sosyal beceri ve problem davranışları arasındaki ilişkinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). Gazi Üniversitesi, Ankara.
- Karasar, N. (2000). *Bilimsel araştırma yöntemi*. Ankara: Nobel Yayınları.
- Karip, E. (1998). Dönüşümcü liderlik. *Kuram ve Uygulamada Eğitim Yönetimi*, 4(4), 443-465.
- Keleş, O. (2013). *Okul öncesi öğretmen adaylarının ve okul öncesi öğretmenlerinin sınıf yönetimine ilişkin tutum ve inançlarının incelenmesi* (Yayımlanmamış yüksek lisans tezi). Çukurova Üniversitesi, Adana.
- Kızılkaya, C. (2017). *Ortaokullarda çalışan öğretmenlerin liderlik özellikleri ile sınıf yönetim becerileri arasındaki ilişkinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). İstanbul Aydın Üniversitesi, İstanbul.
- Koçel, T. (2010). *İşletme yöneticiliği*. İstanbul: Beta Yayınları.
- Kök, M., & Bektaş, F. (2010). Ortaöğretimde görev yapan öğretmenlerin liderlik stillerinin belirlenmesi. *Çağdaş Eğitim Dergisi*, 35(381), 15-21.
- Korkmaz, İ., Saban, A., & Akbaşlı, S. (2004). Göreve yeni başlayan sınıf öğretmenlerinin karşılaştıkları güçlükler. *Kuram ve Uygulamada Eğitim Yönetimi*, 38, 266-277.
- Li, Y. L. (2015). The culture of teacher leadership: A survey of teachers' views in Hong Kong early childhood settings. *Early Childhood Education Journal*, 43, 435-445. doi: 10.1007/s10643-014-0674-1
- Magen-Nagar, N., Schwabsky, N., & Firstater, E. (2019). The role of self-efficacy components in predicting Israeli kindergarten teachers' educational leadership. *International Journal of Leadership in Education*, 1-23. doi: <https://doi.org/10.1080/13603124.2019.1613569>
- Manning, M. L., & Bucher, K. T. (2013). *Classroom management: Models, applications, and cases*. Pearson & Merrill Prentice Hall, Upper Saddle River, NJ.
- Memişoğlu, S. P., & Çakır, M. (2015). Öğretmenlerin liderlik stilleri ile sınıf içi öğretmen davranışları arasındaki ilişkinin incelenmesi. *Turkish Studies*, 10(15). doi: 633-648. 10.7827/TurkishStudies.8806.
- Mettiäinen, V. (2016). Early childhood education teachers and leaders becoming the leadership(s). *Reconceptualizing Educational Research Methodology*, 7(2), 62-73. doi: 10.7577/term.1842
- Nur, M. (2012). *Bağımsız anaokullarında örgüt iklimi ile öğretmenlerin sınıf yönetimi becerileri arasındaki ilişkinin incelenmesi (Malatya ili örneği)* (Yayımlanmamış yüksek lisans tezi). İnönü Üniversitesi, Malatya.
- Oliver, R., & Reschly, D. (2007). *Effective classroom management: Teacher preparation and professional development*. Washington. National Comprehensive Center for Teacher Quality.
- Öqvist, A., & Högström, P. (2018). Don't ask me why: Preschool teachers' knowledge in technology as a determinant of leadership behavior. *Journal of Technology Education*, 29(2), 4-19.
- Özçelik, F. (2019). *Okul öncesi öğretmenlerinin sınıf yönetimi becerileri ile öz yeterlikleri arasındaki ilişki* (Yayımlanmamış yüksek lisans tezi). Afyon Kocatepe Üniversitesi, Afyon.
- Özdemir, S., Yalın, H. İ., & Sezgin, F. (2004). *Öğretmenlik mesleğine giriş*. Ankara: Nobel.

- Sadık, F., & Dikici Sığırtmaç, A. (2016). Okul öncesi öğretmenlerinin sınıf yönetim becerileri ve uygulamalarına yönelik görüşlerinin incelenmesi. *Turkish Studies*, 11(14), 631-664. doi: 10.7827/TurkishStudies.9630.
- Şahin-Sak, İ. T., Tantekin-Erden, F., & Pollard-Durodola, S. (2018). Turkish preschool teachers' beliefs and practices related to two dimensions of developmentally appropriate classroom management. *Education* 3-13, 46(1), 102-116. doi: <https://doi.org/10.1080/03004279.2016.1194447>
- Şara, P., Karadedeli, İ. ve Hasanoğlu, G. (2016). Sınıf yönetimi alanında Ulakbim'de taranan makalelerin incelenmesi. *Kırıkkale Üniversitesi Sosyal Bilimler Dergisi*, 6(2), 291-308.
- Selçuk, G. (2014). *Okul öncesi eğitim kurumlarında görev yapan öğretmenlerin liderlik davranışları* (Yayımlanmamış yüksek lisans tezi). Zirve Üniversitesi, Gaziantep.
- Semerci, D. (2015). *Okul öncesi öğretmenlerinin sınıf yönetimi becerileri, öz yeterlik algıları ve mesleki motivasyonları arasındaki ilişkinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.
- Şişman, M., & Turan, S. (2004). *Eğitim ve okul yöneticiliği el kitabı*. Ankara: Pegem.
- Sönmez, E. (2014). *İlk ve ortaokullardaki öğretmenlerin sınıf yönetimi becerileri ile performansları arasındaki ilişki* (Yayımlanmamış yüksek lisans tezi). Kastamonu Üniversitesi, Kastamonu.
- Tal, C. (2010). Case studies to deepen understanding and enhance classroom management skills in preschool teacher training. *Early Childhood Education Journal*, 38, 143-152. doi: 10.1007/s10643-010-0395-z
- Tal, C. (2010). Case studies to deepen understanding and enhance classroom management skills in preschool teacher training. *Early Childhood Education Journal*, 38(2), 143-152. doi: <https://doi.org/10.1007/s10643-010-0395-z>
- Toran, M., & Gençgel, H. (2016). Okul öncesi öğretmenlerinin sınıf yönetimi becerilerinin değerlendirilmesi: KKTC örneği. *Kastamonu Eğitim Dergisi*, 24(4), 2041-2056.
- Turan, S. (2006). Sınıf yönetiminin temelleri. M. Şişman, & S. Turan (Ed.), *Sınıf yönetimi içinde* (ss. 2-14). Ankara: Pegem.
- Wang, M., & Ho, D. (2018). Making sense of teacher leadership in early childhood education in China. *International Journal of Leadership in Education*, 1-15. doi: <https://doi.org/10.1080/13603124.2018.1529821>
- Webster-Stratton, C., Reinke, W. M., Herman, K. C., & Newcomer, L. L. (2011). The incredible years teacher classroom management training: The methods and principles that support fidelity of training delivery. *School Psychology Review*, 40(4), 509-529. doi: <https://doi.org/10.1080/02796015.2011.12087527>
- Wiener, L. C. (2018). *The relationships between early childhood teachers' leadership style and their approaches to managing children with challenging behaviors*. University of Hartford.
- Wu, H. J., Tseng, S. F., & Wu, P. L. (2018). A study of the relationship between directors positive leadership and teachers well-being of kindergartens in Taiwan. *Asian Jjournal of Mmanagement Ssciencess & Education*, 7(4), 1-6.
- Yaşar Ekici, F., Günhan, G., & Anılan, Ş. (2017). Okul öncesi öğretmenlerinin sınıf yönetimi becerileri. *Uluslararası Bilimsel Araştırmalar Dergisi*, 2(1), 48-58. doi: 10.21733/ibad.2092

- Yıldırım, Ö. (2016). *Okul öncesi öğretmenlerinin iş doyumları ile sınıf yönetimi becerileri arasındaki ilişki: Başakşehir ve Küçükçekmece örneği* (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.
- Yıldız, M. (2018). *Okul öncesi öğretmenlerinin tükenmişlik düzeylerinin sınıf yönetimi becerileri ile ilişkisi* (Yayımlanmamış yüksek lisans tezi). İstanbul Aydın Üniversitesi, İstanbul.
- Yılmaz, M., & Aslan, Ö. (2013). Öğretmen motivasyonunun artırılmasında “ÖNKAS” ödül sistemi. *Uşak Üniversitesi Sosyal Bilimler Dergisi*, 6(Özel Sayı), 286-306. doi: 10.12780/UUSBD188.
- Yüksel, A. (2013). *Sınıf öğretmenlerinin sınıf yönetimi becerilerinin değerlendirilmesi (Afyonkarahisar ili örneği)* (Yayımlanmamış doktora tezi). Gazi Üniversitesi, Ankara.

## **Rubric for Evaluating Text Structure-Oriented Reading Tasks: A Study of Validity and Reliability**

**Zeynep Çetinkaya Edizer<sup>i</sup>**

Istanbul University - Cerrahpaşa

**Melda Oryaşın<sup>ii</sup>**

Istanbul University - Cerrahpaşa

**Şükran Dilidüzgün<sup>iii</sup>**

Istanbul University - Cerrahpaşa

**Duygu Ak Başoğlu<sup>iv</sup>**

Istanbul University - Cerrahpaşa

### **Abstract**

In this study, it was aimed to develop a rubric for evaluation of text-based reading tasks and to provide proofs of validity and reliability. In the study, data were collected from the participants who studied at the undergraduate and graduate level in the field of Turkish education. In the development of the rubric, a literature review was conducted, and dimensions (text structure activities, task-based activities) and sub-dimensions (small-scale structure, large-scale structure and superstructure; general tasks and text-oriented reading tasks) were determined. A draft rubric was created by determining 5-point Likert-type score levels for these criteria. The draft rubric was rearranged by taking the opinions of 4 text structure language teaching, 4 task-based language teaching and 2 assessment-evaluation experts. The designed rubric was applied to the participants by using three text types (story, poem and article). Reading activities collected from the study group were scored by 6 raters within the framework of the rubric prepared. Validity (Lawshe, exploratory factor analysis) and reliability (consensus reliability analysis, Cronbach Alpha, correlation coefficient) analyses were performed on the collected data. As a result of Lawshe analysis, the content validity rate was between 0.80 - 1.00, and the content validity index was found to be 0.98. The KMO value for three types was found to be 0.898, and it was determined that the data were suitable for factor analysis. The Cronbach Alpha coefficient is 0.919. The correlation coefficient varied between 0.501 and 0.836 and it was determined that there was a significant, positive and strong correlation at the level of 0.01 among the items. It was concluded that the developed rubric is a valid and reliable measurement tool.

**Keywords:** Text Structure, Reading Tasks, Rubric, Validity, Reliability

**DOI:** 10.29329/ijpe.2023.534.8

**Submitted:** 12/08/2022

**Accepted:** 23/02/2023

**Published:** 01/04/2023

-----  
<sup>i</sup> **Zeynep Çetinkaya Edizer**, Assoc. Prof., Turkish Education, Istanbul University - Cerrahpaşa, ORCID: 0000-0001-5449-5107

<sup>ii</sup> **Melda Oryaşın**, Research Assist. Dr., Turkish Education, Istanbul University - Cerrahpaşa, ORCID: 0000-0001-9584-545X

<sup>iii</sup> **Şükran Dilidüzgün**, Prof. Dr., Turkish Education, Istanbul University - Cerrahpaşa, ORCID: 0000-0001-6627-8337

<sup>iv</sup> **Duygu Ak Başoğlu**, Assoc. Prof. Dr., Turkish Education, Istanbul University - Cerrahpaşa, ORCID: 0000-0003-4065-2030

**Correspondence:** duygu.akbasogul@iuc.edu.tr

## INTRODUCTION

Reading, one of the building blocks of understanding, is a combination of physiological and cognitive features. This combination is a high-level thinking process in which the meaning is structured, planned, controlled and evaluated, and it is structurally defined as a cognitive task/action related to understanding the text (Moorman & Ashwin, 1994; cited in Uzun, 2009). This process includes “understanding and interpreting the written texts and using the meaning in the texts in accordance with the text type, purpose and situation” (Ertem, 2014, p. 52). In order to gain operation skills in this process, it is necessary to develop reading through education. In the context of Balci's (2016, p. 16) “Understanding the text by analyzing and establishing meaning from the text depends on the development and use of certain skills.” words, teaching understanding takes place by the coordinated operation of many factors such as program, textbook, teacher, equipment, etc. There are activities to answer questions about the text in the Turkish textbooks prepared in line with the learning outcomes in the Turkish Language Teaching Program (MEB, 2019a). In this case, the emphasis is mostly on the evaluation of understanding. Pressley (1997; cited in Güneş, 2009) states that students' understanding skills are generally evaluated in schools, and that some students cannot progress in understanding in this way. In the studies conducted, it was found that teachers could not effectively operate the text processing process in Turkish teaching (Coşkun & Alkan, 2010), they asked questions to the students most after the text was read (Baydık, 2011), and they generally asked questions that required basic mental processes (Akyol et al., 2013). ), they did not use time effectively in terms of teaching understanding (Ateş & Akyol, 2013); and they did not constitute a systematic strategy teaching process (Ateş & Yıldırım, 2014). In this context, it can be stated that studies that relate text, strategy and task, which are variables of learning-oriented reading from a metacognitive perspective, are not sufficiently included in Turkish teaching (Dilidüzgün et al., 2019).

In the exams aimed at evaluating countries in the field of reading skills within the scope of the Program for International Students Assessment (PISA), it is seen that the majority of Turkish students who are at the second level or below in the reading scale have a lower average score in open-ended and short-answer questions that require high-level cognitive processes than in optional questions (Bozkurt, 2016). In a study, it is concluded that the activities supporting the use of thinking strategy in Turkish textbooks are 1/257, that is, 0.004%. (Lüle Mert, 2014). According to the results in Turkish in the 8th Grade (MEB, 2019b) Report of the Monitoring and Evaluation of Academic Skills (ABIDE) conducted in Turkey, it is seen that 1.6% of the students are below basic, 23.5% are basic, 41% are intermediate, 26.8% of them are upper-intermediate and only 7.2% of them are advanced.

Reading-comprehension is to be able to use a text in accordance with its meaning and function by analyzing the structure of the text as a result of a cognitive process; that is, it is an action in the nature of a duty. In this context, reading activities need to be scrutinized from two aspects: *content and structure*. Content is related to which of the text structure criteria of the activity is based on (Genç, 2019). The structure is the organization of the activity as a task in a way that will lead the student to a cognitive process. In this context, in the continuation of the study, *text structure and reading activities, task phenomenon and reading activities, text structure and reading tasks* will be emphasized.

### Text Structure and Reading Activities

Since language teaching requires language use (Kocaman, 1996), in Turkish teaching, texts that are the product of language use should have the best examples that comply with the text creation criteria (Beaugrande & Dressler, 1981) and reflect the characteristics specific to their genres. The aim of teaching Turkish is for students to analyze and compose texts created in different contexts and for different purposes. Every text has a communicative purpose, and the text structure shaped by this communicative purpose determines the type of text. Uzun Subaşı (2006) points to the existence of "linguistic" relations between consecutive utterances in the small-scale structure of the text, "logical" relations that provide rhetorical structuring in the large-scale structure of the text and that affect the perception of the utterances in a semantic integrity, and "discursive" relations in the metatextual structure of the text that regulate its compatibility with intended uses. Reference, substitution, ellipsis,

conjunctions, parallelism, tense and aspect, functional sentence perspective, intonation are small-scale structural elements related to grammatical cohesion; and repetition and collocational patterning are small-scale structural elements related to lexical cohesion. Any analysis that will be made by considering the whole text such as plot, narrator, point of view, function, title, subject, keywords, main idea, content scheme, summary, style, concluding sentence is related to the large-scale structure (Van Dijk & Kintsch, 1983). The interpretation of the text and anything that can be said of genre-specific concerns the superstructure. These criteria are performed with different content in each text type. Reaching the meaning of the text requires analyzing the linguistic pattern that appears in the surface structure. As every text is original, the activities prepared for them should also be original (Dilidüzgün, 2011); however, it is seen that the reading activities in Turkish textbooks are not structured specific to the genre in parallel with the curriculum, and similar reading-comprehension activities are carried out for each genre (Dilidüzgün, 2013; Karagöz & Dilidüzgün, 2016).

The main purpose of reading education is to raise individuals who are aware of the characteristics of the text in the reading process and who can read effectively and critically (Çetinkaya Edizer et al., 2018). Individuals come together with different types of text in line with their reading purposes, and they determine the reading strategies to be applied by the structural features of the text, which differs according to the text types. In this context, teachers' knowledge of text types will contribute to supporting students' development on this subject (McCarthy & Carter, 1994). Kucan and Beck, in their study with narrative and explanatory texts, observed that students read genres in different ways (Cited by Grabe, 2002). While students tried to reach important information by making assumptions, inferences, predictions and comments in the narrative texts, they tried to understand the information given in detail in the explanatory texts. For this reason, reading tasks should be presented to students in reading education that will enable them to operate cognitive processes in accordance with the text structure criteria that change according to the purposes of the genres. This process is defined by Bamberger (1990, p. 13) as “supporting and encouraging the ability of reading in a way that preserves the ability to read in different genres and for different purposes throughout one's life”. This means always dealing with the aspects of the language in the text dimension, producing texts suitable for students' communication status, and understanding the produced texts in language lessons, (Huber, 2008). Shokouhi and Jamali (2013) also state that reading from a metacognitive perspective is in question when texts, tasks, strategies and student characteristics are considered. Therefore, it can be said that the readers adjust themselves according to the text, text type and text genre (Hudson, 2015).

Activities prepared for each type of text must meet at least one text structure criterion. When the activities in Turkish textbooks are examined in this context, it is seen that the text structure specific to the text type is not taken into account, the meaning pattern of the text cannot be questioned because there are no reading order activities, and a monotype activity approach is adopted without considering the genre (Çetinkaya Edizer et al., 2018). Reading activities are considered as the repetition of the language outcomes, and the language elements in the surface structure of the texts are not used to make sense of the texts in the preparation of the activities (Dilidüzgün, 2010). As a result of this, it is seen that the reading education criteria and reading learning outcomes cannot be realized. The text structure criteria targeted in the reading activities in Turkish textbooks are generally limited to the first levels of PISA (Genç, 2019). In Turkish teaching, reading activities are insufficient to meet the learning outcomes based on the text structure (Dilidüzgün, 2010), and it is seen that the rate of activities in the context of text-oriented is 10.6% at the 6th grade level, 9.5% at the 7th grade level and 18.4% at the 8th grade level (Dilidüzgün, 2009).

### **Task Phenomenon and Reading Activities**

The content of reading activities developed according to the text structure is not sufficient for the development of reading skills. What is more, there is also a need for activities that require students to analyze these structures themselves and involve them in the cognitive process. Metacognitive competencies are activated when readers reflect on reading activities, watch and organize reading activities to achieve a goal (OECD, 2010). In the Turkish Language Curriculum (MEB, 2019a, p. 8) in which the constructivist approach is adopted, this requirement is stated as “The structure and hierarchy

of the learning outcomes from the first grade to the eighth grade are arranged in a way that will contribute to the development of students' basic language skills as well as their high-level cognitive skills.”. Teachers in constructivist classrooms act as a guide by creating situations or contexts that provide and facilitate the communication function between students through texts and activities (Demircan, 1990). Students, on the other hand, are the people who make the communication. They create their own and other students' interpretation processes interactively to control the language use process and ensure accuracy. While the teacher assumes a less dominant role in this process, the students take on a lot of responsibilities in realizing their own learning (Larsen Freeman, 2001). This is only possible by assigning certain “tasks” to students.

Ellis (2003) emphasizes that for a study to be a task, it requires a work plan, meaning orientation, actual language use, language skills, a specific outcome and cognitive process; in other words, a real linguistic input, a meaningful goal, a cognitive or psycho-motor process and a product at the end are required (Günay, 2007). According to Larsen Freeman and Anderson (2014), the principles of task-based learning are teacher's taking an input-providing role at the beginning of the lesson, students' involvement in the cognitive process for the purpose of making sense, observing students' level of achievement of the task, emphasizing the meaning dimension of the language and realizing the use of language by making use of basic language skills are stimulating outputs for communication, preparation for the real world, speaking and writing. At the last stage, students analyze the language they use for the task and make applications based on the necessary improvements and developments (Harmer, 2007). During the task, students read, listen, take notes, speak to a crowd and so on. (Yaylı & Yavuz, 2008). According to Willis (2004), three basic principles for task design are educationally space-taking, reaching a decision/solution, and creating general or text-oriented tasks. General tasks are listing, jumbles and sorting, matching, comparing, problem solving, sharing personal experiences, projects, and creative tasks. The cognitive processes and possible products created by general tasks are given in Table 1:

**Table 1.** Types of Tasks and Cognitive Processes (Willis, 1996; as cited in Dilidüzgün, 2009)

<b>Task type</b>	<b>Cognitive process</b>	<b>Possible product</b>
<i>Listing</i>	Brainstorming and finding information	Completed list, A draft mind map
<i>Jumbles and sorting</i>	Jumbles, organizing according to personal values, placing in groups, classification	List of information arranged according to certain criteria
<i>Matching</i>	Listening-matching, Reading-matching	Paired items
<i>Comparing</i>	Games based on finding similarities/differences	Identifying similarities/differences between subjects/pictures/texts
<i>Problem solving</i>	Analyzing, reasoning, decision making	Reaching a conclusion
<i>Sharing personal experiences</i>	Narrating, describing, exploring and expressing thoughts and attitudes	Interaction in a social context
<i>Projects and creative tasks</i>	Combination of processes such as brainstorming, finding information, jumbles, etc.	Project or extracurricular studies

Text-oriented tasks define why the text should be understood. These tasks allow students to identify large-scale propositions of texts and arrive at their general meaning, rather than focusing on local coherence relations between certain words or propositions selected from the text. The same goal is adopted in the Turkish Curriculum (2005, p. 158); “Understanding means understanding the whole of the text, not just reaching the meaning of parts (words, sentences, paragraphs). The parts must be considered in the whole. Therefore, in the learning process, the focus should be on the whole, instead of focusing on the parts that are separated from each other.” Willis (1996) lists these tasks as prediction tasks, jumble tasks, restoration tasks, jigsaw/ split information tasks, comparison tasks and memory challenge tasks, and gives examples of possible tasks (see Table 2):

**Table 2.** Text-Oriented Task Types and Possible Tasks (Willis, 1996; as cited in Dilidüzgün, 2009)

Types of Text-Oriented Tasks	Possible tasks
<i>Prediction tasks</i>	Prediction from the title or first parts of the text, selected chapters, pictures or sound/silent movies
<i>Jumble tasks</i>	Unjumbling jumbled text parts Ordering jumbled summary sentences Sorting jumbled pictures by text
<i>Restoration tasks</i>	Completing the text by identifying the words, phrases and sentences removed/added in the text
<i>Jigsaw/split information tasks</i>	Reading/listening different parts of the text by different groups and then combining them to reach the whole
<i>Comparison tasks</i>	Comparing two different narrations of the same event Comparing the diagram/picture with the written text
<i>Memory challenge tasks</i>	After looking at the text for a short time, listing and telling what is remembered or asking questions

It is difficult to say that reading activities on texts in Turkish teaching have the nature of a task, since they are generally not sufficient to operate cognitive processes in structure. It is observed that most of the reading activities do not provide input that will allow students to enter the cognitive process by examining the text structure, students are evaluated on the result rather than the process by expressing reading learning outcomes as an activity, output is requested without giving sufficient input, and skill development is not achieved sufficiently (Dilidüzgün et al., 2016).

The characteristics that are expected to be seen in the individual at the end of the education-teaching process are called educational goals/learning outcomes (Demirel, 2012), and the goals assume a strategic role in terms of providing a start to the other elements of an education program. Bloom's Revised Taxonomy includes the dimensions of remembering, understanding, applying, analyzing, evaluating and creating (Anderson et al., 2014; Bümen, 2006). It is a requirement of the constructivist approach, which has been based in the Turkish education system since 2005, that reading activities are not only dependent on the text structure, but also as a task in which the student can operate these cognitive processes. In summary, text, task, cognitive dimensions and learning outcomes are concepts that need to be operated together in language teaching today.

It is observed that the principles and teaching processes of Turkish Lesson Curriculum and task-based language teaching overlap (Dilidüzgün, 2009). Students' building new knowledge on the one they have already acquired, developing students' cognitive skills such as understanding, ordering, relating, classification, prediction, analysis-synthesis, interpretation and evaluation, use of natural context, integration of skills, making meaning, motivation, group work, individual learning styles, reaching the product, and the teacher's role as a guide are common principles. Joint learning and teaching processes are considered as activating knowledge in students' mental schemas prior to engagement, operating cognitive processes such as elimination, selection, ordering, classification, matching, comparison, reasoning, evaluation, verification within the duty cycle, applying knowledge, reviewing and eliminating its deficiencies, making applications such as speaking, writing, and visual presentations as a report.

### Text Structure and Reading Tasks

In Turkish textbooks, there are more definition and interpretation questions for understanding the content; there are almost no questions for analysis, explanation, inference and evaluation (Amanvermez İncirkuş & Özçetin, 2021; Deniz et al., 2019). Sallabaş and Yılmaz (2020) state that 32% of the sub-text questions are suitable for remembering, 35% for understanding, 11% for analysis, 18% for evaluation, and 4% for creation. In some textbooks, it is seen that the application and analysis dimension is almost never included (Çevik & Güneş, 2017). Reading activities on the text should also have the ability to analyze the text structure in order to reach the information in the texts, integrate and interpret the information, and evaluate the in-text and extra-text information together.



The tasks defined in literacy are also classified under three main headings as reaching information-remembering information, gathering information-interpreting and reflecting-evaluating information in parallel with the dimensions specified in Bloom's Revised Taxonomy (OECD, 2019). These tasks work in relation to the text structure:

- In *accessing information*, students identify and recognize basic elements such as character, place/time and setting, and then searches for the same words or concepts that may be synonymous/ antonym or closely related in the text. This action is collocational patterning studied under the lexical cohesion of the text.
- In *integration*, the consistency in the text is questioned. Coherence relations between sentences, connections between multiple texts are investigated. A title is selected or found for the text, or conversations within the text, the end of the text is predicted. It is studied on the function of subject change determinants such as "first, second" or "at the beginning, later, later, before" and so on in describing the order of instructions or events in the context of content structure or discourse determinants in the context of the fiction of the text. In the context of grammatical cohesion, tasks are organized that reveal the relationships between connectors such as causal, opposition, jumbles and so on and parts of a text. Studies can be done that introduce a graphic or table as a discontinuous text, determine its purpose, or interpret continuous and discontinuous texts together to extract the meaning. In the small-scale structure, student monitor the references, repetitions, relationships between propositions and create a hierarchy among them; so they can choose the most general, inclusive main idea from the given options. Such a task shows whether students can distinguish key ideas and details or recognize the main idea in a sentence or title. Students make inferences with the relations they have established in the context of consistency, make comments, and perform tasks that determine the evidence that their inferences may be correct. Student may also be asked to explain or interpret the author's stylistic use and identify the author's purpose and attitude (OECD, 2019).
- *Reflecting and evaluating* involves using intertextual knowledge, ideas or attitudes to relate information in the text to one's own conceptual and experiential frameworks. Reader evaluates the author's use of a particular genre and textuality to achieve a particular purpose.

In line with all this theoretical framework, the aim of the research is to develop a "Text Structure-Oriented Reading Tasks Evaluation Rubric" as a valid and reliable measurement tool in which reading activities can be evaluated as content (text structure) and structure (task) in order to create and evaluate reading activities adopted by contemporary approaches in reading education. The designed rubric was applied using three text types (narrative, informative and poetry) which are based on the Turkish Lesson Curriculum (MEB, 2019a) and frequently found in Turkish textbooks. The rubric is the first study in the field to measure the applicability of the constructivist approach in Turkish teaching.

## METHOD

### Research Model

Rubric is a scoring tool that lists the criteria of a work and evaluates these criteria in terms of quality. Since rubrics are powerful tools for teaching and assessment, they appeal to both students and teachers (Goodrich Andrade, 1997). In this study, an evaluation rubric was developed for text structure-oriented reading tasks in order to guide the teaching and evaluation of reading.

In the research, first of all, literature was scanned, were determined, criteria were created by determining the dimensions and sub-dimensions of the rubric, the score levels for the criteria were determined, a draft rubric was created, expert opinions were taken, the structure was restructured,

reading activities were collected from the study group, scoring was carried out within the framework of the rubric prepared by the experts, and validity and reliability analyzes were carried out on the collected data.

### Study Group

In the development process of the rubric, expert opinions were used to ensure content validity, and rater evaluations were used for reliability. In the pilot application, data were collected from the participants who received undergraduate and graduate education in the field of Turkish Education. These people constitute the study group of the research. In the determination of the study group, criterion sampling, one of the purposeful sampling methods, was taken as the basis. While creating the sample in criterion sampling, the purpose of the study, the people, events, objects, or situations related to the problem it focuses on are taken into consideration (Büyüköztürk, 2012). Accordingly, the criterion of having worked in the fields of text structure and/or task-based language teaching was prioritized in the selection of experts and raters. In the pilot implementation process, volunteering and professional (Turkish teacher candidate, Turkish teacher and academician) and educational (undergraduate, graduate, doctoral) diversification were given importance. For this reason, it was tried to reach volunteer students studying at undergraduate and graduate levels in different universities, and volunteer Turkish teachers and academicians working in different cities. The information of the study group is as follows:

- The opinions of 10 experts were consulted, including 4 in the task-based language teaching model, 4 in the text structure and 2 in the measurement-evaluation fields.
- Of the 6 raters, 4 are academicians and 2 are Turkish teachers.
- In the pilot application, participant information differs according to the text type. For this reason, the table given about participant information (see Table 3) has been prepared as genre-oriented:

**Table 3.** Participant Information Regarding the Pilot Implementation

Variables		Story/f	Poetry/f	Article/f
Gender	Female	106	86	81
	Male	59	46	44
Profession	Student (Turkish Teacher Candidate)	88	59	58
	Turkish Teacher	63	62	55
	Academician	14	11	12
Education	Undergraduate	115	85	83
	Master's	34	34	28
	Doctorate	16	13	14

In Table 3, the participant information obtained from the participant information forms is based on the text type by considering the gender, profession, and education variables. presented. These variables differ according to the genres. The preferences of the participants were effective in this. The majority of the participants prioritized preparing activities for the story (f=165) genre. Participant returns decreased in activity practices for poetry (f=132) and article (f=125) genres. Female participants predominate in all genres. In terms of professional and educational aspects, it is seen that the participants at the undergraduate level, namely Turkish teacher candidates, predominate.

### Data Collection Tool

The data collection tool of the research is the “Text Structure-Oriented Reading Tasks Evaluation Rubric”. This rubric basically consists of two dimensions; *text structure activities* and *task-based activities*. Text structure activities have three sub-dimensions as *small-scale structure* (7 items), *large-scale structure* (12 items), and *superstructure* (3 items). Task-based activities, on the other hand,

consist of *general tasks* (7 items) and *text-oriented reading tasks* (6 items). The prepared rubric contains 35 items in total.

An important feature of rubrics is to create score levels (Moskal, 2000, p. 3). The rubric prepared in this study also states, “0: Very insufficient. 1: Insufficient. 2: Moderately sufficient. 3: Enough. 4: Very enough.” is scored.

For the rubric, first of all, the literature was scanned, the dimensions and sub-dimensions of the rubric were determined, and the items were prepared. The items were presented to expert opinions and restructured in line with the corrections and feedback given by the experts, and the rubric was given its final form. Since data will be collected from human participants during the development of the rubric, approval was obtained from the Istanbul University-Cerrahpaşa, Social and Human Sciences Research Ethics Committee (Document number: 74555795-050.01.04- Document date: 12.11.2019). Afterwards study group was presented with the short story “Last Birds (Son Kuşlar)” by Sait Faik Abasıyanık (2012), the informative text named “Mass Communication Tools (Yığın İletişim Araçları)” by Önder Şenyapılı (1981) and the poem “I’m Listening to Istanbul (İstanbul’u Dinliyorum)” by Orhan Veli (1953), and they were asked to prepare reading activities. The texts, together with the participant information form, were sent to the participants via e-mail. For some participants who are studying at the undergraduate level, they were applied face-to-face in the classroom environment for three weeks, respectively, as stories, poems, and articles. These activities, prepared by the participants, were scored within the framework of rubrics by two experts in each text type. The collected data were analyzed with exploratory factor analysis based on principal component analysis, Lawshe analysis, consensus reliability analysis, Cronbach Alpha reliability coefficient and intraclass correlation coefficient.

## RESULTS

In this section, the findings related to the validity and reliability obtained from the research are presented.

### Findings Related to Validity

Validity “is the degree to which what is intended to be measured can be measured; is that what is wanted to be measured can be measured without mixing it with other things.” (Karasar, 2012, p. 151). Validity is one of the basic qualities that a good measurement tool should have, and it most commonly relies on three types of evidence: content, structure, and criterion (Moskal & Leydens, 2000). In order to determine the suitability, meaningfulness and usefulness of the rubric developed within the scope of the study, the criteria of content validity and construct validity were applied.

Content validity is about determining the suitability of the items in a measurement tool and reflecting the area to be measured, and expert opinions are taken to reach the result (Büyüköztürk et al., 2013; Karasar, 2012). In this context, the rubric in draft form includes the criteria of text structure (small-scale structure, large-scale structure, and superstructure) and the tasks foreseen by the task-based learning approach (general and text-oriented tasks). The items listed in the rubric were created by scanning the literature. 22 items on text structure were written based on Dilidüzgün (2018), Genç (2019), Dilidüzgün and Genç (2019); 13 items created in the context of task-based learning approach were written based on Ellis (2003) and Willis (2004). In this context, a draft rubric consisting of 2 basic and 5 sub-dimensions, and 35 items was prepared. Dimensions was designed as a 5-point likert “Very sufficient=4; enough=3; moderately sufficient=2; insufficient=1; very insufficient=0”. Prepared rubric was sent to 4 experts in the field of task-based teaching model, 4 experts in the field of text structure and 2 experts in the field of measurement-evaluation with an “expert opinion form”. The draft rubric was restructured in line with the specified corrections and feedback. Field experts suggested lexical and semantic rearrangement of some items. In this direction, some items in the rubric were changed and clarity was ensured. In the writing of the items related to task-based learning, all field experts suggested a partnership. Considering this suggestion, regulations were made. Assessment

experts, on the other hand, found the rubric appropriate. Opinions of 10 experts were received on whether the criteria for the prepared rubric were appropriate for the purpose and whether each criterion was related to the sub-dimensions determined. In this direction, the content validity rate and the content validity index developed by Lawshe (1975) were calculated. This technique, also known as the Lawshe technique, is calculated using the formula  $CVR = \frac{N_G}{N/2} - 1$ .  $N_G$  used here is the experts who said that the item is necessary, and N is the number of experts who gave their opinion. According to this technique, the opinion of a minimum of 5 and a maximum of 40 experts is required.

**Table 4.** Content Validity Rates (CVR) and Content Validity Index (CVI) of the Rubric

Item	Expert Opinion (Appropriate)	Expert Opinion (Needs to be adjusted)	Expert Opinion (Not appropriate)	CVR
1	10	-	-	1
2	9	1	-	0.80
3	10	-	-	1
4	9	1	-	0.80
5	9	-	1	0.80
6	10	-	-	1
7	10	-	-	1
8	10	-	-	1
9	10	-	-	1
10	10	-	-	1
11	10	-	-	-
12	9	1	-	0.80
13	9	1	-	0.80
14	9	1	-	0.80
15	9	-	1	0.80
16	9	1	-	0.80
17	9	1	-	0.80
18	9	1	-	0.80
19	10	-	-	1
20	10	-	-	1
21	10	-	-	1
22	9	-	1	0.80
23	9	1	-	0.80
24	9	1	-	0.80
25	9	1	-	0.80
26	9	1	-	0.80
27	9	1	-	0.80
28	9	1	-	0.80
29	9	1	-	0.80
30	10	-	-	1
31	9	1	-	0.80
32	10	-	-	1
33	9	1	-	0.80
34	10	-	-	1
35	10	-	-	1
<b>Total Number of Experts 10</b>				
<b>Content Validity Index 0.98</b>				

According to the CVR calculation converted into a table by Veneziano and Hooper (1997), the minimum critical point of CVR was determined as 0.62, since the opinions of 10 experts were taken in the project, and the content validity rate was seen to range from 0.80 to 1.00. Accordingly, it was concluded that the criteria determined reflect the purpose. The content validity index was found to be 0.98.

Construct validity reveals how accurately the scores obtained from the test can measure the concept (structure) to be measured (Büyüköztürk, 2002). One of the most commonly used methods for construct validity is factor analysis. Exploratory factor analysis is used to reveal the factor structure of the scale. In the study, KMO values and Bartlett Test results were examined for each type of text (story, poem, article), as well as for the entire data set.

**Table 5. KMO and Bartlett Test Results**

Criteria	KMO	Bartlett (sig.)
Story	.780	.000
Poetry	.732	.000
Article	.717	.000
<b>All</b>	<b>.898</b>	<b>.000</b>

For story, poem, article types and the entire data set, firstly descriptive statistical results have been looked at. All questions were included in the factor analysis since no variable with a variance of 0 was found in other criteria except for poetry. In poetry type, since the standard deviation of an item (i7) was found to be 0, this variable was not included in the factor analysis in order to use exploratory factor analysis.

As seen in Table 5, the KMO value for the story was found to be 0.780, and it was concluded that the data were suitable for factor analysis. The KMO value for poetry was found to be 0.662 (weak). The KMO value takes a value between 0 and 1, and the closer it is to 1, the more suitable the sample is for factor analysis. Therefore, in order to increase the coefficient, important variables explaining the total variance of the data were determined. The total variance values were examined, and it was concluded that there were 13 items that could represent better instead of 35 items. In order to find out which variable these 13 factors correspond to, the component matrix was examined, and it was concluded that the items i1, i8, i9, i10, i12, i13, i14, i15, i17, i18, i24, i28, i33 would better represent the data. Thereupon, factor analysis was carried out once again with 13 determined variables. As a result of the size reduction and analysis, the KMO coefficient increased to 0.732. The KMO value for the article was found to be 0.717, and it was concluded that the data were suitable for factor analysis. The KMO value for the entire data set was found to be 0.898, and it was determined that the data were suitable for factor analysis.

After the content and construct validity processes were completed, the rubric's compliance with the face validity was checked once again, and the validity process was completed.

### Findings Related to Reliability

Reliability is about how accurately a measurement tool measures the feature it wants to measure (Büyüköztürk et al., 2013). Reliability, which is one of the first conditions of scientific studies, helps to obtain the same results by following the same processes (Karasar, 2012). In order to determine the reliability of the rubric developed within the scope of the study, the level of significance was calculated by using the consensus-based reliability analysis to calculate the reliability of the items based on expert opinion, the Cronbach Alpha reliability coefficient for internal consistency, and the Spearman correlation coefficient using test splitting.

The reliability formula [ $\text{Reliability} = \text{Consensus} / (\text{Agreement} + \text{Disagreement})$ ] proposed by Miles and Huberman (1994) was used to calculate the reliability based on the suitability of the criteria in the rubric, and it was observed that the reliability of the determined criteria ranged from 0.90 to 1.00.

The Cronbach Alpha coefficients calculated to determine the internal consistency of the rubric are presented in Table 6:

**Table 6. Cronbach Alpha Coefficients Related to the Rubric**

Criteria	Cronbach Alpha Coefficient
Story	.848
Poetry	.696
Article	.878
<b>All</b>	<b>.919</b>

According to Table 6, it is seen that the Cronbach Alpha coefficients obtained on the basis of all criteria of the rubric developed within the scope of the study vary between 0.696 and 0.919. Cronbach's Alpha coefficient was calculated over 35 items in the story, article, and the entire data set, and over 13 items in the poem, taking into account the items that were previously removed as a result of the validity study. While the threshold value accepted in the literature is 0.70, when the number of items is low, 0.60 and above are considered quite reliable (Durmuş et al., 2011). In line with these results, it can be said that the rubric has internal consistency and is reliable.

Spearman correlation coefficients for the story ranged between 0.537 and 0.753, between 0.501 and 0.899 for the article, and between 0.501 and 0.836 for the entire data set; and it was determined that there was a significant correlation at the level of 0.01 between the items. The correlation coefficient varies between -1 and +1. In this context, the correlation coefficient is positive correlation between 0 and 0.50, and it can be said that there is a strong positive correlation between the items with coefficients greater than 0.70 and 0.70. For poetry, it was seen that no items that had a significant correlation with each other were found.

## CONCLUSION

In the process of making sense, reading activities should be created and evaluated in terms of content (text structure) and structure (task) within the framework of contemporary approaches. Therefore, in this study, it is aimed to develop a rubric for evaluating text structure-oriented reading tasks.

In the development of the rubric, a literature review was conducted in the context of text structure and task-based language teaching, and two main dimensions were determined: text structure activities and task-based activities. Text structure activities from these main dimensions are small-scale structure, large-scale structure, and superstructure; task-based activities' main dimension consisted of general tasks and text-oriented reading tasks sub-dimensions. Then, as "0: Very insufficient. 1: Insufficient. 2: Moderately sufficient. 3: Enough. 4: Very enough." in the form of a 5-point Likert-type score levels were determined. The created form was presented to the opinions of 4 text structure, 4 task-based language teaching and 2 assessment-evaluation experts.

Content validity rate and content validity index were calculated based on the opinions of 10 experts on whether the criteria were fit for purpose and whether each criterion was related to the determined sub-dimensions. Accordingly, since the content validity rate ranged from 0.80 to 1.00, it was concluded that the criteria reflected the purpose. The content validity index is 0.98. Exploratory factor analysis was conducted to describe the factor structure of the rubric in the context of construct validity. Accordingly, in the study, KMO values and Bartlett Test results were examined for each of the story, poem, and article types and for the entire data set. The KMO values were 0.780 for the story, 0.732 for the poem, 0.717 for the article, and 0.898 for the entire data set. Therefore, it has been concluded that the rubric is a valid measurement tool in terms of content and structure. In addition, it was confirmed that the rubric had face validity in line with the opinions of the experts.

To determine the reliability of the rubric, reliability analysis based on the consensus of experts, Cronbach Alpha reliability coefficient and Spearman correlation coefficient were used. It was observed that the reliability of the criteria determined by the consensus-based reliability analysis ranged from 0.90 to 1.00. On the basis of all criteria, Cronbach's Alpha coefficients vary between 0.696 and 0.919. In line with these results, it can be said that the rubric has internal consistency and is a reliable tool. When looking at the relationship between the items for reliability, it was determined that the correlation coefficients for the story ranged from 0.537 to 0.753, for the article 0.501 to 0.899, and for the entire data set between 0.501 and 0.836. It was also determined that there was a significant, positive, and strong correlation at the level of 0.01 between the items. It was concluded that the developed rubric is a valid and reliable measurement tool.

The Assessment Rubric for Text Structure-Oriented Reading Tasks has two dimensions as *text structure activities* and *task-based activities*. The text structure activities consist of *small-scale structure* (7 items), *large-scale structure* (12 items) and *superstructure* (3 items); and task-based activities consist of *general tasks* (7 items) and *text-oriented reading tasks* (6 items). The prepared rubric (see Appendix-1) consists of 35 items in total and is a valid and reliable measurement tool that can be used in the creation and evaluation of text-based reading activities.

**Conflicts of Interest:** No potential conflict of interest was declared by the authors.

**Funding Details:** No funding or grant was received from any institution or organization for this research.

**CRedit Author Statement:** All authors contributed equally to each part of the article.

**Ethical Statement:** The ethical approval was obtained from the Istanbul University-Cerrahpaşa, Social and Human Sciences Research Ethics Committee (Document number: 74555795-050.01.04- Document date: 12.11.2019).

## REFERENCES

- Abasıyanık, S. F. (2012). *Son Kuşlar*. İstanbul: İş Bankası Kültür Yayınları.
- Amanvermez İncirkuş, F. & Özçetin, K. (2021) Türkçe Ders Kitaplarındaki Metni Anlama Sorularının Eleştirel Düşünme Becerilerine Göre İncelenmesi. *RumeliDE Journal of Language and Literature Studies*, 22, 290-311.
- Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., Rath, J. & Wittrock, M. C. (2014). *Öğrenme Öğretim ve Değerlendirme ile İlgili Bir Sınıflama: Bloom'un Eğitim Hedefleri ile İlgili Sınıflamasının Güncellenmiş Biçimi* (Trans. D. A. Özçelik) (2nd ed.). Ankara: Pegem Akademi Yayıncılık.
- Akyol, H., Yıldırım, K., Ateş, S. & Çetinkaya, Ç. (2013). Anlamaya Yönelik Nasıl Sorular Soruyoruz?. *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, 9(1), 41-56.
- Ateş, S. & Akyol, H. (2013). Türkçe Dersi Öğretme-Öğrenme Sürecinin Anlama Öğretimi Açısından Değerlendirilmesi. *Türk Eğitim Bilimleri Dergisi*, 11(3), 268-300.
- Ateş, S. & Yıldırım, K. (2014). Öğretmenlerin Sınıf İçi Uygulamaları: Strateji Öğretimi ve Anlama. *İlköğretim Online*, 13(1), 235-257.
- Balcı, A. (2016). *Okuma ve Anlama Eğitimi*. Ankara: Pegem Yayınları.
- Bamberger, R. (1990). *Okuma Alışkanlığını Geliştirme* (Trans. B. Çapar). Ankara: Kültür Bakanlığı.
- Baydık, B. (2011). Okuma Güçlüğü Olan Öğrencilerin Üstbilişsel Okuma Stratejilerini Kullanımı ve Öğretmenlerinin Okuduğunu Anlama Öğretim Uygulamalarının İncelenmesi. *Eğitim ve Bilim*, 36(162), 301-319.
- Beaugrande, R. de & Dressler, W. U. (1981). *Introduction to Textlinguistics*. Longman: London.
- Bozkurt, B. Ü. (2016). Türkiye’de Okuma Eğitiminin Karnesi: PISA Ölçeğinden Çıkarımlar. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi*, 16(4), 1673-1686.
- Bümen, N. (2006). Üç Büyük İldeki Özel Okullarda Program Geliştirme Servislerinin Etkililiği ve Karşılaşılan Problemler. *Kuram ve Uygulamada Eğitim Bilimleri*, 6(3), 615-667.

- Büyüköztürk, Ş. (2002). Faktör Analizi: Temel Kavramlar ve Ölçek Geliştirmede Kullanımı. *Kuram ve Uygulamada Eğitim Yönetimi*, 32, 470-483.
- Büyüköztürk, Ş. (2012). Örneklem Yöntemleri. <http://cv.ankara.edu.tr/duzenleme/kisisel/dosyalar/21082015162828.pdf>
- Büyüköztürk, Ş., Kılıç Çakmak, E. Akgün, Ö. E., Karadeniz, Ş. & Demirel, F. (2013). *Bilimsel Araştırma Yöntemleri* (14th ed.). Ankara: Pegem Akademi.
- Coşkun, E. & Alkan, M. (2010). Sınıf Öğretmenlerinin Türkçe Dersi Metin İşleme Sürecine İlişkin Bilgi Düzeylerinin Değerlendirilmesi. *TÜBAR*, 27, 161-184.
- Çetinkaya Edizer, Z., Dilidüzgün, Ş., Ak Başoğlu, D., Karagöz, M. & Yücelşen, N. (2018). Türkçe Ders Kitaplarındaki Okuma Etkinliklerinde Kullanılan Üstbilişsel Okuma Stratejileri ile Okuma Yöntem-Tekniklerinin Metin Türüne Uygunluk Bağlamında Değerlendirilmesi. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 10(29), 479-511.
- Çevik, A. & Güneş, F. (2017). Türkçe Ders Kitaplarındaki Etkinliklerin İncelenmesi. *Ana Dili Eğitimi Dergisi*, 5(2), 272-286.
- Demircan, Ö. (1990). *Yabancı Dil Öğretim Yöntemleri*. İstanbul: Ekin Eğitim-Yayıncılık.
- Demirel, Ö. (2012). *Eğitimde Program Geliştirme* (18th ed.). Ankara: Pegem Akademi.
- Deniz, K., Tarakçı, R. & Karagöl, E. (2019). Okuma Kazanımları Açısından Ortaokul Türkçe Ders Kitapları. *Ana Dili Eğitimi Dergisi*, 7(3), 688-708.
- Dilidüzgün, Ş. (2009). Yapılandırmacı Yaklaşımla Hazırlanan İlköğretim Türkçe Öğretim Programı ve Ders Kitaplarında Metin Odaklı Görevlerin Yeri. *Sakarya Üniversitesi Eğitim Fakültesi Dergisi*, 17, 275-291.
- Dilidüzgün, Ş. (2010). Türkçe Derslerinde Metin Etkinliklerinin Okuma-Anlama Kazanımlarını Gerçekleştirme Yeterliği – Bir Öykü Örneği. *Hasan Ali Yücel Eğitim Fakültesi Dergisi*, 13, 13-30.
- Dilidüzgün, Ş. (2011). Türkçe Öğretiminde Yazın Eğitimi Bağlamında Karşılaştırmalı Metin Türü Çalışmaları. Sever, S. (Eds.) 3. *Ulusal Çocuk ve Gençlik Edebiyatı Sempozyumu (Bildiriler ve Atölye Çalışmaları)*. Ankara: Ankara Üniversitesi Çocuk ve Gençlik Edebiyatı Uygulama ve Araştırma Merkezi.
- Dilidüzgün, Ş. (2013). Ortaokul Türkçe Derslerinde Oku(ma)dan Özet Yaz(ma)ya,. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, 46(2), 47-68.
- Dilidüzgün, Ş. (2018). *Metindilbilim ve Türkçe Öğretimi*. İstanbul: Morpa Kültür Yayınları.
- Dilidüzgün, Ş., Çetinkaya Edizer, Z., Ak Başoğlu, D., Oryaşın, M. & Yücelşen, N. (2019). Metin Türü Bağlamında Okuma Yöntem-Teknikleriyle Üstbilişsel Okuma Stratejilerini İlişkilendirme Çalışması. *Uluslararası Türkçe Edebiyat Kültür Eğitim Dergisi*, 8(3), 1796-1816.
- Dilidüzgün, Ş. & Genç, Ş. (2019). Ortaokul Türkçe Dersi Okuma Etkinliklerinin Okuma Eğitimi Kapsamında Metindilbilimsel Bağlamda Değerlendirilmesi. *International Journal of Language Academy*, 7(2), 107-126.
- Dilidüzgün, Ş., Karagöz, M. & Genç, Ş. (2016). Türkçe Ders Kitaplarında Yazınsal Metinleri Okuma-Anlama Etkinliklerinin Öğrenciler Üzerindeki Şiddet Etkisi. *Zeitschrift für die Welt der Türken*, 3, 115-137.



- Durmuş, B., Yurtkoru, E. S. & Çinko, M. (2011). *Sosyal Bilimlerde SPSS'le Veri Analizi*. İstanbul: Beta Yayıncılık.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford: Oxford University Press.
- Ertem, İ. S. (2014). Okuduğunu Anlama ve Teknoloji. Ertem, İ. S. (Ed.). *Okuma Yazma Eğitimi ve Teknoloji*. Ankara: Nobel Yayınları.
- Genç, Ş. (2019). *Ortaokul Türkçe Ders Kitaplarındaki Okuma Etkinliklerinin Okuma Eğitimi Yeterliği Bağlamında Metindilbilimsel Analizi* (Master's thesis). İstanbul Üniversitesi-Cerrahpaşa, Lisansüstü Eğitim Enstitüsü, İstanbul.
- Goodrich Andrade, H. (1997). Understanding rubrics. *Educational leadership*, 54(4) 14-17.
- Grabe, W. (2002). Narrative and expository, macro-genres. John, A. M. (Ed.) *Genre in The Classroom: Multiple perspectives*. USA: Lawrence Erlbaum Associates.
- Günay, D. (2007). *The exploration of Tasks in the 4th Grade ELT Coursebook Used in State Primary Schools in Turkey* (Master's thesis). İstanbul Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul.
- Güneş, F. (2009). *Hızlı Okuma ve Anlamı Yapılandırma*. Ankara: Nobel Yayın Dağıtım.
- Harmer, J. (2007). *The practice of English language teaching* (4th ed.). England: Pearson Longman.
- Huber, E. (2008). *Dilbilime Giriş*. İstanbul: Multilingual.
- Hudson, T. (2015). *Teaching Second Language Reading* (10th ed.). China: Oxford University Press.
- Karasar, N. (2012). *Bilimsel Araştırma Yöntemi* (24th ed.). Ankara: Nobel Akademik Yayıncılık.
- Karagöz, M. & Dilidüzgün, S. (2016). Alımlama Boyutlarıyla Metin Türüne Özgü Okumalar – Öğretime İlişkin Eleştiri ve Öneriler. Dilidüzgün, S. (Ed.). *Kuram ve Uygulama Bağlamında Türkçe Öğretimi* (pp. 30-39). Ankara: Anı Yayıncılık.
- Kocaman, A. (1996). Dilbilim Söylemi. Kocaman, A., Ruhi, Ş., Zeyrek, D., Doltaş, D., Bengi- Öner, I. & Doğan, G. (Eds.). *Söylem Üzerine* (pp. 1-16). Ankara: Hitit Yayınevi.
- Larsen Freeman, D. (2001). Teaching grammar (3rd ed.). Celce-Murcia, M. (Ed.) *Teaching English as a second or foreign language*. Boston MA: Heinle & Heinle.
- Larsen Freeman, D. & Anderson, M. (2014). *Dil Öğretiminde Teknik ve İlkeler* (3rd ed.) (Trans. M. Calp). Ağrı: Ağrı İbrahim Çeçen Üniversitesi Yayınları.
- Lawshe, C. H. (1975). A quantitative approach to content validity. *Personel Psychology*, 28, 563-565.
- Lüle Mert, E. (2014). 8. Sınıf Türkçe Ders ve Çalışma Kitaplarının Üst Düzey Bilişsel Becerileri Geliştirme Yeterliliği. İşeri, K., Çetinkaya, G., Çelik, T., Demirgüneş, S., Daşöz, T. & Genç, Y. (Eds.). *Türkçe Eğitiminde Kuramsal ve Uygulamalı Çalışmalar* (pp. 145-158). Ankara: Pegem Yayınları.
- McCarthy, M. & Carter, R. (1994). *Language as discourse, perspectives for language teaching*. USA: Routledge.
- MEB (2005). *İlköğretim Türkçe Dersi Öğretim Programı ve Kılavuzu (1-5. Sınıflar)*. Ankara: Devlet Kitapları Müdürlüğü Basımevi.

- MEB (2019a). *Türkçe Dersi Öğretim Programı (İlkokul ve Ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. Sınıflar)*. Ankara: Devlet Kitapları Müdürlüğü Basımevi.
- MEB (2019b). *Akademik Becerilerin İzlenmesi ve Değerlendirilmesi 8. Sınıf Raporu*. Ankara: MEB Yayınları.
- [https://nevehirodm.meb.gov.tr/meb\\_iys\\_dosyalar/2019\\_07/02153549\\_24142454\\_ABYDE\\_8\\_2018\\_Raporu.pdf](https://nevehirodm.meb.gov.tr/meb_iys_dosyalar/2019_07/02153549_24142454_ABYDE_8_2018_Raporu.pdf)
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded Sourcebook*. (2nd ed.). Thousand Oaks, CA: Sage.
- Moskal, B. M. (2000). Scoring rubric: what, when and how? *Practical Assessment, Research & Evaluation*, 7(3), 1-5.
- Moskal, B., & Leydens, J. A. (2000). Scoring rubric development: Validity and reliability. *Practical Assessment, Research & Evaluation*, 7(10), 71-81.
- OECD (2010). *PISA 2009 results: What students know and can do*. <http://www.oecd.org/dataoecd/10/61/48852548.pdf>
- OECD (2019). *How does PISA define and measure reading literacy?* <https://www.oecd.org/pisa/pisa-for-development/8%20-%20How%20PISA-D%20measures%20reading%20literacy.pdf>
- Sallabaş, M. E. & Yılmaz, G. (2020). Türkçe Ders Kitabı'nda Bulunan Metin Altı Sorularının Yenilenmiş Bloom Taksonomisi'ne Göre İncelenmesi. *Ana Dili Eğitimi Dergisi*, 8(2), 586-596.
- Shokouhi, H. & Jamali, R. (2013). *Metacognitive reading strategies and the text type*. Shahid Beheshti University: Deakin University's Research Repository.
- Şenyapılı, Ö. (1981). *Toplum ve İletişim*. Ankara: Turhan Yayınları.
- Uzun Subaşı, L. (2006). Öğrencilerin Yazılı Anlatım Sürecindeki Metinleştirme Sorunları. *II. Ulusal Çocuk ve Gençlik Edebiyatı Sempozyumu Bildirileri* (pp. 693-701). Ankara Üniversitesi, Eğitim Bilimleri Fakültesi, Ankara.
- Uzun, G. L. (2009). Yaratıcı Bir Süreç Olarak Okuma, *Dil Dergisi*, 143, 007-019.
- Van Dijk, T. A. & Kintsch W. (1983). *Strategies of discourse comprehension*. Orlando, Florida: Academic Press, Inc.
- Veli, O. (1953). *Bütün Şiirleri*. İstanbul: Adam Yayınları.
- Veneziano L. & Hooper J. (1997). A method for quantifying content validity of health-related questionnaires. *American Journal of Health Behavior*, 21(1), s. 67-70.
- Willis, J. (1996). *A Framework for task-based learning*. Longman. Essex.
- Willis, J. R. (2004). Perspectives on task-based instruction: undertaking our practices, acknowledging different practitioners. Leaver, B. L. & Willis, J. R. (Eds.). *Task-based instruction in foreign language education*. Washington, D.C.: Georgetown University Press.

Yaylı, D. & Yavuz, M. A. (2008). Göreve Dayalı Öğrenme Yönteminin Yabancı Dil Olarak Türkçe Öğretimine Uygulanmasına İlişkin Sorunlar. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 2(24), 58-68.

## APPENDIX-1: Rubric for Evaluating Text Structure-Oriented Reading Tasks

1. TEXT STRUCTURE ACTIVITIES	0	1	2	3	4
<b>Small-Scale Structure</b>					
1.1.1. It supports distinguishing the functions of affixes.					
1.1.2. It supports the contribution of word types (noun, verb, forename, pronoun, adverb, preposition, conjunction, exclamation) to meaning.					
1.1.3. It supports the evaluation of the contribution of transition and connection expressions to the meaning of the text.					
1.1.4. It supports identifying the semantic disorders in the sentence.					
1.1.5. It supports associating words based on context.					
1.1.6. It supports the meaning relations in the word within the integrity of the text.					
1.1.7. It supports determining the contribution of idioms/proverbs/quotes to the text.					
<b>1.2. Large-Scale Structure</b>					
1.2.1. It supports questioning the purpose of writing the texts.					
1.2.2. It supports questioning the title and subject relationship.					
1.2.3. It supports determining the subject of the text.					
1.2.4. It supports identifying keywords in the text.					
1.2.5. It supports identifying the main idea/message of the text.					
1.2.6. It supports dividing the text into meaningful units.					
1.2.7. It supports interpreting the content of the text.					
1.2.8. It supports determining the order made within the semantic integrity of the text.					
1.2.9. It supports understanding the ways of emphasizing important points in the text.					
1.2.10. It supports making inferences about what they read.					
1.2.11. It supports determining the contribution of figures of speech to the meaning of the text.					
1.2.12. It supports making a summary of the text.					
<b>1.3. Superstructure</b>					
1.3.1. It supports the use of reading strategies suitable for the type of text.					
1.3.2. It supports distinguishing different text type features.					
1.3.3. It supports the evaluation of the text in terms of genre-specific features.					
<b>TASK BASED ACTIVITIES</b>					
<b>2.1. General Tasks</b>					
2.1.1. Listing tasks					
2.1.2. Jumble and classification tasks					
2.1.3. Matching tasks					
2.1.4. Comparing and contradiction tasks					
2.1.5. Problem solving tasks					
2.1.6. Sharing experiences tasks					
2.1.7. Creative tasks					
<b>2.2. Text Oriented Reading Tasks</b>					
2.2.1. Guessing tasks					
2.2.2. Jumble tasks					
2.2.3. Reconstruction tasks					
2.2.4. Jigsaw/split information tasks					
2.2.5. Comparison tasks					
2.2.6. Memory tasks					

0: Very insufficient

1: Insufficient

2: Moderately sufficient

3: Sufficient

4: Very sufficient

## **Review of Researches on Pedagogical Content Knowledge Published in ESERA (2009-2019) Conference Books**

**Şeyma Ulukök Yıldırım<sup>i</sup>**  
Necmettin Erbakan University

### **Abstract**

This study aims to examine the papers prepared on pedagogical content knowledge published in European Science Education Research Association (2009-2019) conference books from a thematic and methodological point of view. For this purpose, 65 papers were examined. Data were collected through document analysis within the framework of the qualitative research approach. Descriptive analysis was used in the analysis of the data. NVivo 12 program was used to present the research data. Researchers mainly conducted studies on the development/detection of PCK. It has been determined that student knowledge and teaching methods knowledge, which are the components of pedagogical content knowledge, are investigated more. As a sample, it mostly worked with secondary school teachers. The qualitative research method was mainly preferred in the research. It has been determined that tests, interviews, and questionnaires are used primarily as data collection tools. In the data analysis, it was seen that the focus was more on content analysis.

**Keywords:** Pedagogical Content Knowledge, Conference Proceedings ESERA, Science Education

**DOI:** 10.29329/ijpe.2023.534.9

**Submitted:** 21/03/2022

**Accepted:** 04/12/2022

**Published:** 01/04/2023

---

<sup>i</sup> **Şeyma Ulukök Yıldırım**, Research Assist, Department of Mathematics and Science Education, Necmettin Erbakan University, ORCID: 0000-0002-6476-9164

**Email:** sulukok@erbakan.edu.tr

## INTRODUCTION

Rapid developments in science and technology increase the importance of science education, which is also reflected in studies on science education. Sharing these studies in the field with other researchers will ensure that scientific knowledge is accessible and developed by everyone. Current trends, attitudes, and subjects that reached saturation in science education can be followed via review studies, graduate theses, handbooks, and international congresses like European Science Education Research Association (ESERA) and National Association for Research in Science Teaching (NARST).

International congresses are a significant part of research and research dissemination. ESERA and NARST are international meetings having great importance in science education. Firstly, papers from NARST and ESERA conferences had been chosen for this study. But most studies handled at the NARST conference were published as summaries and didn't provide extensive knowledge; only papers from the ESERA conference were covered. ESERA conference handles subjects carrying great importance for researchers of science education as one of the leading conferences of the world (Sormunen et al., 2017). This conference has been held regularly since 1995 bi-annually and gives direction to research towards science education. A lot of researchers in the content of science education from developed and developing countries show participation in this conference and share their experiences with each other, and they make contributions to the content of science education with their thoughts and abilities (Alshamrani & Aldahmash, 2020). The selection of papers presented at the ESERA conference is subject to strict arrangements, and complete text or wider summaries are published.

Science and science education are generally discussed with the following sub-dimensions in ESERA declarations:

1. Learning Science: Conceptual Understanding
2. Learning Science: Cognitive, Affective, and Social Aspects
3. Science Teaching Processes
4. Digital Resources for Science Teaching and Learning
5. Teaching-Learning Sequences as Innovations for Science Teaching and Learning
6. Nature of Science: History, Philosophy and Sociology of Science
7. Discourse and Argumentation in Science Education
8. Scientific Literacy and Socio-scientific Issues
9. Environmental, Health, and Outdoor Science Education
10. Science Curriculum and Educational Policy
11. Evaluation and Assessment of Student Learning and Development
12. Cultural, Social and Gender Issues in Science and Technology Education
13. Pre-service Science Teacher Education
14. In-service Science Teacher Education, Continued Professional Development
15. Early Years Science Education

16. Science in the Primary School

17. Science Teaching at the University Level

18. Methodological Issues in Science Education Research (<https://www.esera.org/publications/esera-conference-proceedings>; Retrived March 22, 2021).

This article analyzes the studies on pre-service science teacher education and, inservice science teacher education, continued professional development. In these studies, the professional knowledge of teachers was mainly discussed. Indeed, in recent years, research on teacher competence has focused chiefly on teachers' professional knowledge (Meschede et al., 2017).

An essential aspect of the professional competence of teachers is professional knowledge. Shulman (1986) has indicated that teachers' professional knowledge consisted of different categories. Shulman (1987) has expressed professional knowledge of teachers in a classification of seven types; content knowledge, curricular knowledge, general pedagogical knowledge, knowledge of learners and their characteristics, knowledge of education contexts, pedagogical content knowledge (PCK) and aims, values related to education and their philosophical and historical knowledge. Among these categories, PCK has raised a particular interest because it represents a unique area of expertise that discriminates teachers from content experts (Chan & Hume, 2019).

Shulman (1987) defined PCK as “the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners and presented for instruction” (p.8). Following Shulman’s (1986) context of pedagogical content knowledge, many researchers in education content have recommended many PCK models (Gess-Newsome, 1999, 2015; Grossman, 1990; Hume et al., 2019; Magnusson et al., 1999; Park & Oliver, 2008). Among these emerging PCK models, Magnusson, Krajcik, and Borko's (1999) PCK model is widely used, especially in the science education community. (Abell, 2008; Kind, 2009). Magnusson et al. (1999) put forward their own model of teacher knowledge by utilizing the teacher knowledge model of Shulman (1987) and Grossman (1990). According to the model, PCK consists of five components. These components are orientations to science teaching, knowledge and beliefs about science curriculum, knowledge and beliefs about students’ understanding of specific science topics, knowledge and beliefs about assessment in science, and knowledge and beliefs about instructional strategies for teaching science.

Abell (2008) has expressed that studies related to PCK would keep its popularity as long as teachers and education exist, and science teachers would continue to conduct research towards PCK even 20 years later because PCK makes teaching possible as a profession and legitimizes it (Melo et al., 2017). PCK is accepted as an important element of successful teaching (Park et al., 2011). PCK enlightens researchers and educators of teachers about which forms a good education of science and how science teachers should be (Abell, 2008; Kind, 2009).

The interest of researchers in the subject of PCK continues to increase every day, both in our country and the world, and many theses, articles, and papers are published on this subject. Within this context, a need appears to examine studies conducted in the area of PCK and to evaluate findings. Many studies have been performed targeting to review PCK studies in the area of science towards this need (Abell, 2007; Aydın & Boz, 2012; Belge-Can, 2019; Chan & Hume, 2019; Kind, 2009).

Many researchers have focused on research tendency studies in these papers to determine tendencies of studies in science content through ESERA conference papers in the literature and put forward these studies as a whole. For instance, Alshamrani and Aldahmash (2020) analyzed ESERA papers published between 2011 and 2017 according to their titles, approaches, purposes, data types, and samples. According to the findings, pre-service education of science teachers, in-service education of science teachers, continued professional development, environmental, health, and informal-outdoor science education have been the research subjects that have been most focused on.

Related to research approaches, they have determined that quantitative and mixed methods have been used more in papers. Özcan and Kaptan (2020) have examined papers having socio-scientific content published in the 2016 National Congress of Science and Mathematics Education, and 2017 ESERA conference by descriptive analysis and have reached the finding that the subject of the environment has been the one most examined in 2017 ESERA papers for the aspect of the subject theme. Ecevit et al. (2017) analyzed ESERA papers during the period between 2009 and 2013 according to subject distribution, the number of researchers, and the participation status of countries in conferences. As a finding of the study, they determined that subjects of science education and teaching have been researched subjects taking the most attention in 2009-2011 and in-service education of science teachers in 2013 ESERA conference. Öztürk and Kaptan (2014) have taken 2009 ESERA papers under focus for the aspect of the nature of scientific content, history of science, its sociology, philosophy, and argumentation. As a finding of the study, they have determined that subjects of argumentation hadn't been given any place in our country.

However, any study in which researches about PCK presented on the content of science education has been examined hasn't been found. For this aspect, it is thought that this study will provide a contribution to the literature to demonstrate the general status of research containing the subject of PCK in ESERA conference books and to show their deficient points, prevent their repeat, and provide insight for new studies. When it is thought that PCK is a subject studied for approximately the last thirty-five years, it is expected that this study would act as a source for future studies and show the road to researchers. Starting from this point, it has been aimed in this study that papers prepared about PCK would be examined for thematic and methodological aspects.

1. What are the general thematic characteristics of papers prepared on PCK?

Of papers prepared on PCK;

- i) how is the distribution of themes?
- ii) how is the distribution of PCK component/components?
- iii) were PCK components taken as a whole or a separate component?
- iv) what are subject contents and subjects of science?

2. What are general methodological characteristics of papers prepared on PCK?

Of papers prepared on PCK;

- i) how is distribution according to years?
- ii) what is profile and number of participants?
- iii) how is research method?
- iv) how is distribution according to data collection tools?
- v) what are data analysis methods?

## **METHOD**

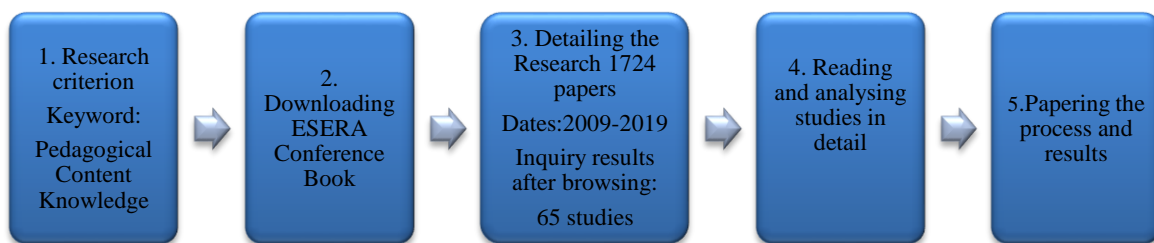
A qualitative research approach was adopted in this study in which the papers prepared on PCK were examined. Qualitative research provides the presentation of research results by reading the collected documents in detail (Merriam, 2009).



### Data Collection and Inclusion Criteria

Data have been collected by document examination technique within the qualitative research approach in the study, and they have been tried to be described. Document examination can be defined as obtaining, reviewing, questioning, and analyzing various documents qualified as primary or secondary sources forming the data set of the research (Özkan, 2019 p.63).

ESERA conference paper books (2009 ESERA conference five books, 14 books in 2011, 16 books in 2013, 19 books in 2015, 18 books for each in 2017 and 2019) were found between 2009-2019 from the research data. Books have been downloaded from <https://www.esera.org/publications/esera-conference-proceedings>, and 1724 papers have been accessed. Browsing has been made using the keyword “pedagogical content knowledge” in conference paper books from 2009-2019. Firstly titles, keywords, and abstracts of research were examined while performing browsing. After the summaries of all documents were scanned, technological pedagogical content knowledge studies were not taken into account. Then, obtained studies were re-examined towards the purpose of the study, and 65 studies were obtained as a finding of required investigations. A matrix has been prepared at the stage of data collection. Educational research made on the content has been utilized while forming the matrix (Çalık & Sözbilir, 2014; Saraç, 2017; Yücel-toy, 2015; Ormancı et al., 2015). The title of papers, author, year, subject studied, research method, profile and a number of participants, data collection tool, and data analysis have been included in this matrix. The process applied in this study is shown in Figure 1.



**Figure 1 Research process**

### Data Analysis

Descriptive analysis was used in this study, in which the papers on PCK in the field of science education published in ESERA conference books were examined. In the study, descriptive analysis was deemed appropriate since it included a detailed examination of the studies on pedagogical content knowledge in the field of science education, grouping and interpreting the data according to predetermined themes.

Firstly papers have been numbered from 1 to 65 in data analysis. These numbers have been used for providing ease for a researcher. Each study has been read in detail towards the purpose and data obtained from each study according to research problems have been transferred to NVivo 12 program. Data have been coded into the program through the matrix. An example of the matrix is shown in figure 2.

Author, year of the study	Aims	PCK components in the studies	Science subjects of the PCK studies	Samples of the studies	Number of participants	Research methods	Data collection	Data analyses

**Figure 2 Example of matrix used in data collection in the research**

Research questions and themes were created by examining the literature studies carried out in the field of PCK (Aydın & Boz, 2012; Belge-Can, 2019; Depaepe et al., 2013; Şimşek & Boz, 2016), and as a result of the examinations, themes, and codes were expanded when necessary. The results of the analyzed studies are presented by examining them in terms of themes. Frequency values were used in the analysis of the data. Data; is presented in figures and graphs.

Studies have been read and analyzed complying with research problems in order to prevent any fault during the coding process. The coding process lasted approximately eight weeks. In order to provide reliability and validity of coding, analyses have been performed again four weeks later. Personal biases sourced from long-term interaction with data sources have been tried to be prevented by careful analyses (Şimşek & Boz, 2016). Similarities and differences between analyses performed with four weeks intervals have been determined and an increase in reliability has been obtained. When discordance occurred between analyses, a common an opinion has been reached by obtaining opinion from an expert academician on content education.

## FINDINGS

The findings of the studies examined within the scope of the research are presented in two parts. The first chapter is presented under three headings as themes, PCK components, science fields, and subjects, which are examined in PCK research. In the second part, general methodological features of PCK studies in science education are presented in five parts year, research method, participant profile and number, data collection tool, and data analysis.

### Findings related to general thematic characteristics of papers prepared on PCK

When the purposes and research questions of papers prepared on PCK were examined, it has been determined that the research have been arranged around nine subjects. Data related to general thematic characteristics of papers prepared on PCK are presented in Table 1.

**Table 1** Themes examined in analyzed papers

Theme	f
Determining PCK competences/status/levels	18
Examination of PCK development	25
Developmental studies of Scale/Test etc. related to PCK	18
PCK relation with different variables	8
PCK comparison	5
Relation/association between PCK components	2
Relation between PCK and student learning outputs	4
PCK review studies	3
Theoretical structure/frame of PCK	2

When Table 1 is examined, the majority of studies aim to address the examination of PCK development and the status of teachers and teacher candidates. There are 25 studies examining PCK development. Some the studies for developing and evaluating educational programs associated with science content have aimed to examine PCK development of teachers or teacher candidates in line with intervention studies such as the use of CoRe (content representation) and professional development. Some of these studies have focused on the development of PCK of teacher candidates during the education of teachers. 18 studies have been conducted for developing scales/tests etc. related to PCK. They are tools, of which validity and reliability have been obtained for measuring the PCK of teacher candidates and teachers. There are 8 studies examining the relation of PCK with different variables. The association of PCK with variables such as subject content knowledge, pedagogical knowledge, personal characteristics, conceptual knowledge, professional experience, cognitive and psychological aspects, etc. has been investigated. There are 5 studies performing PCK comparison. These studies aim to make comparisons of PCKs of teachers having different professional experiences, PCKs of teachers or teacher candidates with different gender and academic success status, PCK status of teachers or teacher candidates on different subjects, PCK status of teachers and

teacher candidates in different countries and PCK status of teachers and teacher candidates from different educational systems. There are 4 studies examining association between PCK and student-learning outputs. These studies have examined reflections of PCK status of teachers having different teaching experiences on their subject onto academic success and motivations of students. There are 2 studies handling association/interaction between PCK components that participants have. While 3 of the studies are in the form of review, 2 describe the theoretical structure or frame of PCK.

### Findings related to PCK component/components in examined papers prepared on PCK

Five components of PCK have been revealed by examining papers prepared on PCK. Data related to PCK components are presented in Table 2.

**Table 2** PCK component examined in papers analyzed

PCK Component	f
Knowledge of instructional strategies (KIS)	36
Knowledge of students (KS)	40
Knowledge of curriculum (KC)	27
Knowledge of measurement and evaluation (KME)	20
Orientation to teaching science (orientation)(O)	23
Ones not indicated	17

When Table 2 is examined, it is seen that researchers mostly focus on student knowledge and teaching methods knowledge. It can be said that student knowledge is the PCK component that is researched more by science education researchers in ESERA papers, and measurement and evaluation knowledge is less researched. There are also studies in which any component of PCK is not expressed, but the main subject of the study is PCK. More than one PCK component has been studied in the papers on PCK.

**Table 3** Status of being together of PCK components in papers analyzed

Type	Total (f)	PCK Component	f
Ones studying single PCK component	12	(KIS), (KS), (KC), (O)	12
Ones studying two PCK components	10	(KS)+ (KIS)	7
		(KC)+ (KS)	2
		(O)+ (KS)	1
Ones studying three PCK components	9	(KIS)+ (O) +(KS)	2
		(KIS)+ (KME) +(KC)	2
		(KIS)+ (KC)+ (KS)	4
		(KS)+ (KME) +(KIS)	1
Ones studying four PCK components	-	-	-
Ones studying five PCK components	17	(KIS)+ (KS)+(KC)+ (KME)+(O)	17

When Table 3 is examined, Magnusson et al. (1999)'s proposed model of PCK studies examining all PCK components are intense. It is possible to say that a significant part of the researchers focuses on examining more than one PCK component. In addition, it is seen that the majority of PCK researchers deal with the teaching methods component in their studies.

### Findings related to science areas examined in PCK studies

Science contents in papers prepared on PCK have been examined in the categories of physics, chemistry, biology, and astronomy.

**Table 4** Areas of science handled in subject-specific PCK studies

Field	Total (f)
Physics	22
Chemistry	28
Biology	14
Astronomy	1
Ones not indicated	16

According to Table 4, it is seen that the majority of papers prepared on PCK have been conducted on the subject contents of chemistry followed by the subject content of physics. Only one study has been done on astronomy. The content of science has been clearly indicated in 16 types of research. Detailed information associated with subjects of chemistry, physics and biology in papers related to PCK are presented in Table 5, 6 and 7.

**Table 5** Chosen chemistry subjects in papers examined

Field	Total (f)	Subject	f
Chemistry	28	Chemical Balance	4
		Electrochemistry	3
		States of Matter	3
		Redox Reaction	2
		Particulate Structure of Matter	2
		Chemical Reactions	2
		Acids and Bases	2
		Gases	1
		Solutions	1
		Atom Models	1
		Melting	1
		Thermochemistry	1
		Reaction Rate	1
		States of Matter	1
		Organic Chemistry	1
		Environmental Chemistry	1
		Periodic Table	1

When Table 5 is examined, chemical equilibrium, states of matter and electrochemistry are most chosen subjects in the content of chemistry. Other chemistry topics studied are Redox Reactions, Particulate Structure of Matter, and Chemical reactions. Subjects included in the subject content of physics are presented in Table 6.

**Table 6** Chosen physics subjects in papers examined

Field	Total (f)	Subject	f
Physics	22	Mechanics	6
		Optic	5
		Electricity	3
		Electric Field	1
		Heat	1
		Particle Theory	1
		Conservation of Energy	1
		Thermodynamics	1
		Energy	1
		Quantum Physics	1
		Newton Laws	1

As can be seen in Table 6, the most frequently handled subjects of physics are mechanics, optics, and electricity.

**Table 7** Chosen biology subjects in papers examined

Field	Total (f)	Subject	f
Biology	14	Respiratory System	3
		Genetics	3
		Photosynthesis	1
		Central Nervous System	1
		Ecology	1
		Meiotic Division	1
		Mitotic Division	1
		Water cycle	1
		Clotting	1
		Circulatory System	1

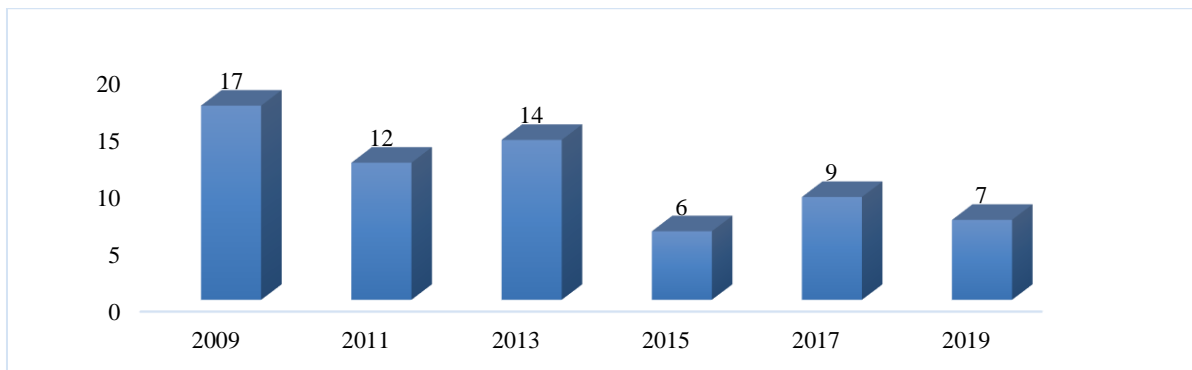
When Table 7 is examined, it is seen that most chosen subjects of biology are respiratory systems and genetics in PCK papers.

### Findings associated with general methodological characteristics of papers prepared on PCK

In this section of the research, findings related to the year, the content of the discipline, research method, type and size of sample, data collection tool, and data analysis of papers prepared on PCK have been presented in the form of tables or figures.

#### Distribution of papers on PCK according to years

Distribution of papers prepared on PCK according to years is presented in Figure 3.



**Figure 3** Distribution of papers prepared on the subject of PCK according to years

When Figure 3 is examined, it is seen that papers on PCK have been made most in 2009 and least in 2015. However, it can be told that PCK studies have been included each year when the ESERA conference was arranged.

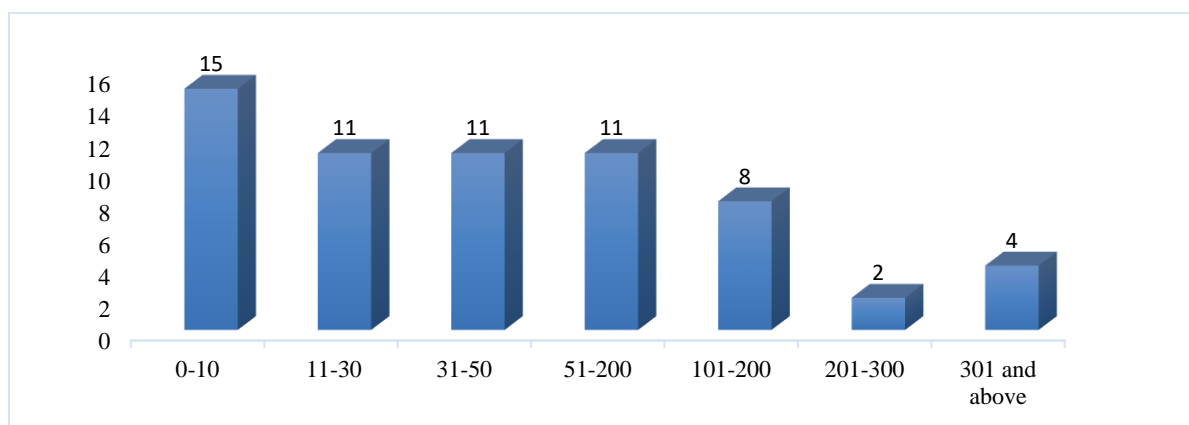
#### Findings related to profile and number of participants of papers prepared on PCK

The Participant profile of papers prepared on PCK is presented in Table 8 and data related to the number of participants are presented in Figure 4.

**Table 8** Participant profile of papers prepared on the subject of PCK

Participant Profile	Total (f)	Branches	f
Teacher	39	Biology Teacher	8
		Science Teacher	8
		Physics Teacher	9
		Chemistry Teacher	11
		Class Teacher	1
		Pre-school Teacher	2
Teacher Candidate	26	Biology Teacher Candidate	1
		Science Teacher Candidate	5
		Physics Teacher Candidate	9
		Chemistry Teacher Candidate	10
		Mathematics Teacher Candidate	1
Academician	5	Professor	2
		Lecturer	2
		One for whom any title wasn't indicated	1
Student	6	High School Student	3
		Middle School Student	1
		Elementary School Student	1
		Student of Psychology Department	1
Other	3	Biologist	1
		Chemist	1
		Physicist	1

When Table 8 is examined, it is seen that PCK studies were conducted mostly with teachers. Studies with teacher candidates and academicians follow it. Physics and chemistry teachers have been studied most among teachers. Most of the data on teacher candidates have been collected from teacher candidates in chemistry and physics. Figure 4 gives data related to the number of participants.

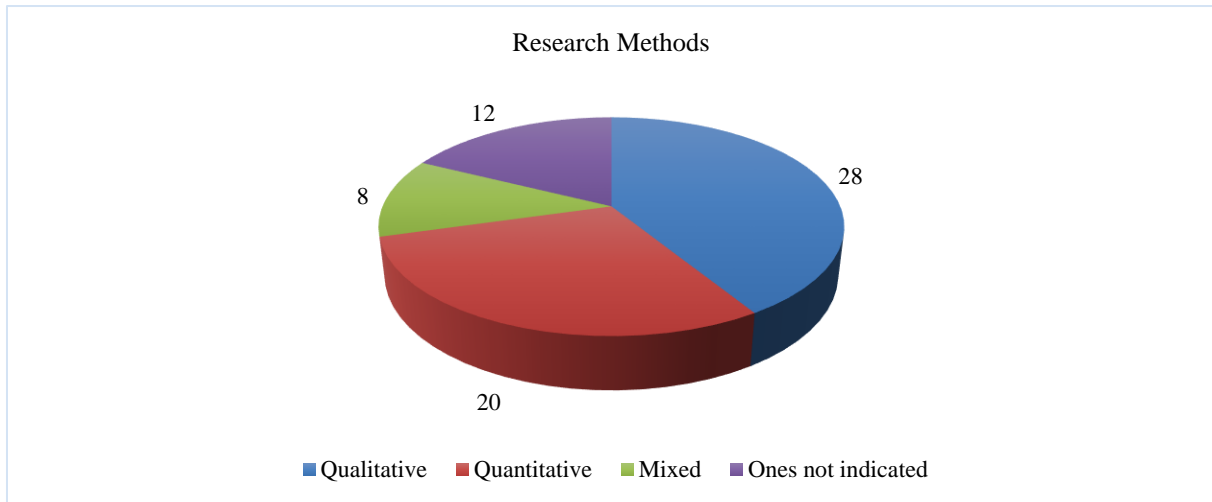


**Figure 4** Distribution of papers prepared on the subject of PCK related to number of participants

When Figure 4 is examined, the most chosen number of participants ranges between 0-10 in papers made on PCK. Ranges of participant numbers 11-30, 31-50, and 51-100 follow it. On the other hand, studies with a large number of participants were also preferred in the papers.

#### Findings related to method/types of research used in papers prepared on PCK

When Figure 4 is examined, the most chosen number of participants ranges between 0-10 in papers made on PCK. Ranges of participant numbers 11-30, 31-50, and 51-100 follow it. On the other hand, studies with a large number of participants were also preferred in the papers.



**Figure 5** Research methods used in papers prepared on the subject of PCK

As is seen in Figure 5, researchers tend to use qualitative research methods more in studies made. The second most chosen research method is quantitative research methods. The least chosen research method is the mixed research method. In addition, any research method hasn't been indicated in the twelve studies.

#### Findings related to data collection tools used in papers on PCK

Distributions according to data collection tools used in papers prepared on PCK are shown in Table 9.

**Table 9** Data collection tools used in papers prepared on the subject of PCK

Data collection tools	f
Test	22
Interview	18
Questionnaire	11
Observation/ Video records	11
Content Representation (CoRe)	8
Scales	6
Lecture plan	5
Vignette	4
Inventory	3
Pedagogical and Professional Experience Repertoire ( <i>PaP-eRs</i> )	2
Concept map	2
Field notes	2
Diaries	1
Reports	1
Rubrics	1

When Table 9 is examined, it is seen that the most chosen data collection tool is the test. Another data collection tool frequently preferred by researchers is interviewing. Questionnaire, observation/video records and content representation follows it, respectively. The least chosen data collection tools are diaries, papers, and rubrics.

#### Findings related to data analysis method used in papers prepared on PCK

Findings related to data analysis methods used in papers prepared on PCK are presented in Table 10.

**Table 10** Distribution related to data analysis method of papers

Theme	Code	f
Data analysis	Frequency/percent	4
	Mean/Standard deviation	3
	Correlation Analysis	8
	Rasch Analysis	7
	t test	7
	ANOVA	5
	Regression Analysis	3
	MANOVA	2
	Mann-Whitney-U test	2
	Kruskal-Wallis test	1
	Chi-Square Test	1
	Structural Equity Model	1
	Wilcoxon T-test	1
	Content Analysis	22

When Table 10 is examined, it is seen that the quantitative data analysis method is used most as a data analysis method. Correlation analysis, rasch analysis and t test have been used most in researches where quantitative data analysis had been chosen. It has been determined that content analysis method is used in qualitative data analysis.

## CONCLUSION, DISCUSSION AND RECOMMENDATIONS

This study aimed to examine the papers prepared on PCK for thematic and methodological aspects published in ESERA (2009-2019) conference books to put forward the general tendencies and to provide guidance for future studies. In line with this purpose, 65 papers have been examined, and reached findings have been included below.

PCK studies conducted in science education have been executed towards determining PCK competencies, examination of PCK development, PCK relation with different variables, scale/test, etc. development studies related to PCK, the relation between PCK and student learning outputs, PCK comparison, relation/interaction between PCK components, review studies and theoretical structure/frame of PCK.

Most studies have been performed by researchers on PCK development, scale/ test, etc. development related to PCK and determining PCK status. These types of studies are essential because they will reveal detailed results about what should be done to develop the PCK of teachers and teacher candidates, which methods should be preferred, and how the lessons should be designed. Studies about the theoretical structure of PCK and about the relation/interaction between PCK components are limited. When these findings are compared with the results obtained from international PCK literature, it can be expressed that similarities and differences are present. When PCK literature research is examined, it is seen that there is a tendency to investigate the nature of PCK towards determining PCK development and developing measuring-evaluation tools (Belge-Can, 2019). This is due to the need to provide stronger empirical evidence and develop a tool that is easy to apply to many participants. Belge-Can's (2019) review pointed out that build-up is excessive in studies towards the development/determination of PCK in research related to PCK in Turkey and that scale development studies rarely differ from international literature. Though it is seen that there are an excessive the number of research about PCK development, valid measuring tools that permit larger scale research with more comprehensive participants for a longer duration are still lacking related to PCK development (Chan & Hume, 2019). However, more research is needed on the influence of contextual knowledge, cognitive and sensual factors on PCK and the relationship between PCK and student-learning outputs.

It has been determined that student knowledge and knowledge of teaching strategy have been studied most in research among PCK components. This is due to the fact that researchers do not base their study on a particular model of PCK. This situation shows parallelism with the findings obtained



from national and international literature. Belge-Can (2019) has indicated that knowledge of teaching strategy and student knowledge have been the PCK components that have been examined most by science researchers in Turkey. Sayın et al. (2021) have pointed out that most knowledge of teaching strategy and student knowledge have similarly been included in studies. One of the striking findings in this study is that the great majority of researchers have included an orientation component in their studies. Abell (2007) and Belge Can (2019) have indicated that the least handled PCK component has been orientation. It is also recognized that there aren't enough studies related to measuring and evaluation in ESERA papers. Avargil et al. (2012) have indicated that the knowledge of measuring and evaluation has been the hardest task faced, which is an advanced professional development stage for teachers. Unfortunately, the component of knowledge of measuring and evaluation, which is extremely important for the learning and teaching process, hasn't been an open target of research. In 17 studies, researchers did not explicitly state any component of PCK, but PCK was the main subject of the study.

When the PCK components examined in the studies were examined, it was seen that the researchers worked with more than one PCK component. However, some studies deal with all components of PCK together. More research can be given to the researchers questioning the relationship/interaction between PCK components.

When papers prepared on PCK are examined according to their subjects, it has been seen that mainly chemistry and physics subjects have been studied. Only a limited number of studies have focused on the subjects of astronomy. Although Aydın and Boz (2012) have indicated that any PCK study couldn't be accessed in the context of physics, there are PCK studies on every continent and various subjects such as astronomy, physics, chemistry, biology as well as national (Belge-Can, 2019) and international literature (Abell, 2007) in subsequent years. Popular subjects in PCK research are chemical equilibrium, states of matter, and electrochemistry in the context of chemistry, while they are mechanics, electricity, and optics in physics. While they are the respiratory system and genetics in the context of biology, they are the solar system and universe in astronomy. Therefore, giving importance to astronomy and biology subjects may contribute to subject content because PCK should be studied subject-based due to its subject-specific nature (Abell, 2008).

It was concluded that the highest number of papers on PCK was made in 2009, followed by 2013, and the least published year was 2015. Schneider and Plazman (2011) have pointed out that PCK is a popular but still developing structure.

The participant profile of PCK studies consists mainly of teachers and teacher candidates. This situation also parallels the literature (Abell, 2007; Belge-Can, 2019; Loughran et al., 2004; Sayın et al., 2021). Most studies have been performed with teacher candidates and chemistry and physics teachers.

When the research on science education related to PCK is considered, it is seen that they have been performed primarily with middle school science teachers as participants (Chan & Hume, 2019). In PCK studies in which teacher candidates participated, teacher candidates of biology were less included. There are few studies in which academicians were included in the sample profile of PCK studies. As Sayın et al. (2021) indicated, reasons that researchers and academicians who will perform analysis are busy that quantitative long-term data collection from academicians might be complex and personal causes may be shown as a cause for this situation. Studies conducted with biology teacher candidates, academicians, and lecturers would contribute to future research.

When the sample sizes of the papers included in the research were examined, it was seen that the groups of 0-10 people were studied at most. One of the remarkable results of the analysis is that some studies collect data from a wide range of participants. PAB-related scale/test etc. To carry out development studies, the targeted sample size should be large. More large-scale studies on PCK are needed. It can be stated that the research method preferred in the study affects the number of participants.

It has been determined that most studies are qualitative research, and therefore qualitative data collection tools and qualitative data analysis methods have been used excessively. Mainly the use of qualitative methods in studies may find from the thought that it would be more suitable due to PCK having a complex structure and providing more in-depth and detailed information. Several studies using qualitative and quantitative research methods are numerically superior to studies by the mixed method. Findings obtained in PCK studies comply with findings obtained in PCK literature (Chan & Hume, 2019). Sayın et al. (2021) and Belge-Can (2019) have pointed out that the great majority of studies have been performed by using qualitative research methods. Abell (2008) has criticized giving priority to qualitative status studies in the international areas and has recommended that quantitative and mixed design researches on PCK content need to be given place. It can be said that studies adopting quantitative and mixed research methods with long-term and larger groups of participants are needed for future research. Although research methods are an essential part of studies, any suitable research method hasn't been indicated in 12 studies. This finding may be explained by not being careful while writing a scientific letter about research methods.

It has been determined that tests are mainly used as a data collection tool in the studies. Easy evaluation of PCK, especially in large samples, ease of data collection, accessing more data in a shorter time, and ability to analyze data quickly can be shown as a reason for choosing those tests. There is a need for valid and reliable measuring tools for the future to provide more powerful empirical evidence. However, interviews, observations, and questionnaires have been prominent data collection tools in studies. This shows similarity with findings obtained from literature screening related to PCK on the content of science education (Aydın & Boz, 2012; Belge-Can, 2019; Chan & Hume, 2019; Sayın et al., 2021). Mostly different data collection tools have been used together in studies. Due to the complex nature of PCK, using multiple methods presents a clearer picture of PCK (Baxter & Lederman, 1999; Park & Suh, 2015).

Mainly quantitative data analyses have been used in examined studies. Among these methods, analyses such as correlation analysis, Rasch analysis, and t-tests have been made frequently. It has been determined that the content analysis method has been used in qualitative data analysis. Although qualitative research methods have been used more in studies performed, an excess number of quantitative data analyses may demonstrate the use of more than one analysis in quantitative data analysis. Consequently, PCK starting from its appearance, occurs as a powerful focus where the professional knowledge of teachers can be examined by using different participants, contexts, data, methods, and analyses.

**Conflicts of Interest:** The author declares no potential conflict of interest in this study.

**Funding Details:** No funding or grant was received from any institution or organization for this research.

**CRedit Author Statement:** The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

**Ethical Statement:** The author declares that her work is not subject to ethics committee approval since the study analyzed the documents.

## REFERENCES

- Abell, S. K. (2007). Research on science teacher knowledge. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of research on science education* (pp.1105-1151). New Jersey: Lawrence Erlbaum Associates.
- Abell, S. K. (2008). Twenty years later: Does pedagogical content knowledge remain a useful idea? *International Journal of Science Education*, 30, 1405-1416.

- Alshamrani, S. M., & Aldahmash, A. H. (2020). A Systematic review of research articles on science education published in the ESERA proceedings from 2011 to 2017. *Education and Science*, 45(202), 1-16.
- Avargil, S., Herscovitz, O., & Judy Dori, Y. (2012). Teaching thinking skills in context-based learning: teachers' challenges and assessment knowledge. *Journal Science Education Technology*, 21(2), 207-225.
- Aydın, S., & Boz, Y. (2012). Review of studies related to pedagogical content knowledge in the context of science teacher education: *The Turkish case, Educational Sciences: Theory & Practice*, 12, 479–505.
- Baxter, J. A., & Lederman, N. G. (1999). Assessment and content measurement of pedagogical content knowledge, In J. Gess- Newsome (Ed.), *Examining pedagogical content knowledge: The construct and its implications for science education* (pp.147-162). Hingham, MA, USA: Kluwer Academic Publishers.
- Belge- Can., H. (2019). Review of pedagogical content knowledge studies: the case of science education. *The Journal of National Education*, 48(224), 353-380.
- Chan, K. K. H., & Hume, A. (2019). Towards a consensus model: Literature review of how science teachers' pedagogical content knowledge is investigated. In A. Hume, R. Cooper, & A. Borowski (Eds.), *Repositioning PCK in teachers' professional knowledge* (pp. 3-76). Singapore: Springer.
- Çalık, M., & Sözbilir, M. (2014). Parameters of content analysis. *Education and Science*, 39(174), 33–38.
- Depaepe, F., Verschaffel, L., & Kelchtermans, G. (2013). Pedagogical content knowledge: A systematic review of the way in which the concept has pervaded mathematics educational research. *Teaching and Teacher Education*, 34, 12–25.
- Ecevit, T., Karagöz, F., & Kaptan, F. (2017). A review of the research studies in science education published in the proceedings of the ESERA conferences (2009-2011-2013). *Kastamonu Education Journal*, 25(6), 2447-2464.
- Gess-Newsome, J. And Lederman, N.G. (Eds.) (1999). *Examining Pedagogical Content Knowledge*. London: Kluwer Academics Publishers.
- Gess-Newsome, J. (2015). A model of teacher professional knowledge and skill including PCK: Results of the thinking from the PCK Summit. In A. Berry, P. Friedrichsen, & J. Loughran (Eds.), *Re-examining pedagogical content knowledge in science education* (pp. 28-42). New York, NY Routledge.
- Grossman, P. (1990). *The Making of a Teacher*. New York: Teachers College Press.
- Hume, A., Cooper, R., & Borowski, A. (2019). *Repositioning pedagogical content knowledge in teachers' knowledge for teaching science*. Singapore: Springer.
- Kind, V. (2009). Pedagogical content knowledge in science education: Perspectives and potential for progress. *Studies in Science Education*, 45(2), 169–204.
- Loughran, J., Mulhall, P., & Berry, A. (2004). In search of pedagogical content knowledge in science: Developing ways of articulating and documenting professional practice. *Journal of Research in Science Teaching*, 41, 370-391.

- Magnusson, S., Krajcik, J., & Borko, H. (1999). Nature, sources, and development of PCK for science teaching. In J. Gess-Newsome and N.G. Lederman (Eds.), *Examining PCK: The Construct and Its Implications for Science Education* (pp. 95-120). Boston: Kluwer Academic Press.
- Meschede, N., Fiebranz, A., Möller, K., & Steffensky, M. (2017). Teachers' professional vision, pedagogical content knowledge and beliefs: On its relation and differences between pre-service and in-service teachers. *Teaching and teacher education*, 66, 158-170.
- Melo, L., Cañada, F., & Mellado, V. (2017). Exploring the emotions in pedagogical content knowledge about the electric field. *International Journal of Science Education*, 39(8), 1025-1044.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco: Jossey-Bass.
- Ormancı, Ü., Çepni, S., Deveci, İ., & Aydın, Ö. (2015). A thematic review of interactive whiteboard use in science education: Rationales, purposes, methods and general knowledge. *Journal of Science Education and Technology*, 24(5), 532-548.
- Özcan, C., & Kaptan, F. (2020). Investigation of 2016 UFBMEK and 2017 ESERA papers with socioscientific content by descriptive content analysis. *Teacher Education and Instruction* 1(1), 14-24.
- Özkan, U. B. (2019). Document review method for educational science research. *Ankara: Pegem Academy*.
- Öztürk, E., & Kaptan, F. (2016). A view on “ESERA 2009” science education researches conference and its content studies about nature of science, argumentation, history, philosophy and sociology of science. *Kastamonu Education Journal*, 22(2), 649-672.
- Park, S., & Oliver, J. S. (2008). Revisiting the conceptualisation of pedagogical content knowledge (pck): pck as a conceptual tool to understand teachers as professionals. *Research Science Education*, 38, 261-284.
- Park, S., Jang, J. Y., Chen, Y. C., & Jung, J. (2011). Is pedagogical content knowledge (PCK) necessary for reformed science teaching? Evidence from an empirical study. *Research in Science Education*, 41(2), 245-260.
- Park, S., & Suh, J. K. (2015). From portraying toward assessing PCK: Drivers, dilemmas, and directions for future research. In *Re-examining pedagogical content knowledge in science education* (pp. 114-129). Routledge.
- Saraç, H. (2017). Researches related to outdoor learning environments in Turkey: content analysis study. *Journal of Educational Theory and Practice Research*, 3(2), 60-81.
- Sayın, V., Uluçınar-Sağır, Ş. & Ermiş, M. (2021). Investigation of postgraduate theses about the pedagogical content knowledge in turkey between the years 2015-2020. *Gazi Education Faculty Journal*, 41(1), 379-413.
- Schneider, R. M., & Plasman, K. (2011). Science teacher learning progressions: A review of science teachers' pedagogical content knowledge development. *Review of Educational Research*, 81(4), 530-565.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.

- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1-22.
- Sormunen, K., Hartikainen-Ahia, A., & Jäppinen, I. (2017). Quality of SSI scenarios designed by science teachers. In K. Hahl, K. Juuti, J. Lampiselkä, A. Uitto, & J. Lavonen (Eds.), *Cognitive and affective aspects in science education research* (pp. 103–116). Cham, Switzerland: Springer.
- Şimşek, N., & Boz, N. (2016). Analysis of pedagogical content knowledge studies in the context of mathematics education in Turkey: A meta-synthesis study. *Educational Sciences: Theory & Practice*, 16(3).
- Yücel-Toy, B. (2015). A thematic review of preservice teacher education research in turkey and reflections of teacher education policies. *Education and Science*, 40(178), 23-60.

## **The Examination of Representations in Primary School Science Textbooks from the Perspective of Multimodal Genre Analysis**

**Elif Güven Demir<sup>i</sup>**

Düzce University

### **Abstract**

This study conducted a genre analysis to determine the representations in primary school science textbooks. Multiple representations in textbooks indicate multimodality. This study adopted a multimodal genre analysis approach to review the multiple representations in textbooks within the framework of the “scientific” genre. The sample consisted of two primary school textbooks taught to third and fourth graders within the scope of “the science” course in the 2021-2022 academic year. The data were gathered based on document analysis and analyzed using content analysis. Frequency and percentage were used for analysis. The results show that the most common representations in the textbooks are photographs and iconic diagrams. The third-grade textbook has more representations than the fourth-grade textbook. The representations in the textbooks are primarily associated with the scientific genres “explanation” and “information report.” Of the scientific genres in the textbooks, photographs are primarily used in “information report,” “explanation,” and “narration.” Iconic diagram representation is preferred in “experimental,” “argumentative,” and “technical procedure.” Certain representations are predominantly used in the textbooks, indicating that the textbooks lack a diversity of representations. In addition, the scientific genres are underrepresented in the textbooks, suggesting that the textbooks underutilize the advantages offered by different types of representations. We recommend that textbooks should be enriched with representations and scientific genres.

**Keywords:** Genre Analysis, Multimodality, Representation, Science, Textbook

**DOI:** 10.29329/ijpe.2023.534.10

**Submitted:** 19/09/2022

**Accepted:** 27/02/2023

**Published:** 01/04/2023

---

<sup>i</sup> **Elif Güven Demir**, Assist. Prof. Dr., Primary School Department, Düzce University, ORCID ID: 0000-0001-6685-5341

**Email:** elifguvendemir@duzce.edu.tr

## INTRODUCTION

Both verbal and nonverbal language is used to conduct all learning and teaching processes (Wellington & Osborne, 2001). We need more than verbal language to do science and communicate (Lemke, 1998). Combining verbal discourse, mathematical expressions, and visual representations rationally is necessary to perform, speak about, read, and write science (Lemke, 1998). Science education requires communication (verbal, visual, symbolic, graph, concrete, etc.) that employs various teaching approaches and satisfies different learning styles and abilities (Wellington & Osborne, 2001). In the framework of TIMSS 2019, there is an emphasis on visualizing information for science education and utilizing different types of representations in problem-solving (Mullis et al., 2021).

The use of multiple representations in education presents different perspectives, increasing information accuracy and precision, promoting various forms of expression of information, providing specificity, and presenting different levels of complexity and difficulty (Jong et al., 1998). Representations are artifacts as an integral part of the language of science, symbolize an idea or concept concerning science education, and can be used in different forms, such as analogies, verbal explanations, written texts, diagrams, and simulations (Tang et al., 2014).

The social semiotic theory is often used to understand the language in science education and the process of creating meaning (Tang et al., 2022). Teachers can use various semiotic modes (creating meaning using words, images, symbols, actions, and other ways of communication) in science education (Wellington & Osborne, 2001). Semiotic theory expresses the structure and functionality of language, visuals, and their combinations in a particular context (Hiippala, 2014). Genre and multimodality are two ways of applying social semiotics theory in science education. This study combined them and used them to examine textbooks.

### *Genre and Multimodality*

Scientific language is examined on three levels: “vocabulary” (e.g., word and expression), “grammar” (e.g., sentence structure), and “genre” (e.g., discourse) (Tang & Rappa, 2020). “Genre” is related to the structure and organization of a text (Tang, 2022). Expressing the intersection of language and scientific practices, “genre” is about the purpose of a text's production, consumption, and presentation (Tang & Rappa, 2020). From the point of view of science education, the use of genre involves examining the linguistic structure of scientific texts (explanatory, experimental, etc.) (Tang et al., 2022; Tang & Rappa, 2020). Genre analysis is conducted to compare texts to describe their features, define the possibilities offered to readers by genres, and reveal the social function of genres (Bateman, 2014).

Nowadays, forms of communication are rapidly transforming, and the new understanding of texts does not fit into the existing typology of genres; therefore, researchers have revised the concept of genre to develop the multimodal genre analysis approach (Valerías Jurado & Ruiz-Madrid, 2015). From the perspective of social semiotics, the mode is a culturally and socially shaped source of meaning-making processes (Mills & Unsworth, 2017). Multimodality is the combination of multi-sensory and communicative modes, such as vision, sound, print, visual, video, music, etc., that produce meaning for any message (Dressman, 2019). From the perspective of social semiotics, some examples of modes are social semiotics, speech, gesture, written language, music, mathematical expressions, drawings, photographs, and digital motion images (Mills & Unsworth, 2017).

On the other hand, the multimodal genre analysis approach considers the concept of species in its most general form as a goal-oriented activity based on social motivation to provide multimodal communication (Xia, 2020). Multimodal genre analysis is not limited to written language and verbal elements but also includes the combination of different forms of expression that best convey messages by using other possibilities and epistemological commitments provided by representations (Valeiras-Jurado, 2012). At this point, the creation of the multimodal model, the essence of which is the design

process, includes the order of the design, epistemology (for each element), and decision-making processes about the mode (Kress, 2003).

From the point of view of science education, the content and activity employed in different types of representations cause students to communicate with learning objects in different roles/dimensions (Kress, 2003). Salloum (2021) examines intertextuality in science education and argues that multimodality is necessary, but not enough, to improve students' conceptual understanding of science subjects. Moreover, the intertextuality between multiple modes points to the significance of discourse style and science language variables. However, researchers maintain that traditional scientific genres are boring and unpleasant genres that cause female students to lose interest in science (Hildebrand, 1996; Keys, 1999).

Understanding and using different types (explanatory, argumentative, descriptive, etc.) in science education are the basic components of scientific literacy (Yore et al., 2004). Tang and Rappa (2020) state that teachers and students have difficulty defining the structural and linguistic forms of these types (explanatory, informative, experimental, argumentative) and understanding why they are used and what they do in a typical science class. The focus of teaching and scientific explanations is the meaning embedded in different types of representation and the coordination of those types of representations (Tytler & Prain, 2010). In other words, not focusing on representations and their scientific styles causes a problem (Tang & Rappa, 2020). An essential component of science education is to help students understand the rationale for how scientific knowledge is generated, validated, and communicated according to specific types rather than presenting them with a simplified "scientific method" (Tang & Rappa, 2020).

Scientific explanations based on multiple representations help students develop a scientific understanding (Tytler & Prain, 2010). In recent years, there has been a growing body of research that explains how representations are used to construct scientific explanations in science education (Park et al., 2020); Tang et al., 2022; Yeo & Gilbert, 2017). However, the concept of species is unclear for some researchers as it involves examining a limited number of genres through student drawings (Park et al., 2020). They regard it as a concept limited to a specific subject (Yeo & Gilbert, 2017). Moreover, some researchers conduct genre analyses to examine the types of representations produced by students while learning concepts (Tang et al., 2022). The present study adopted a genre analysis perspective to investigate the multiple representations in textbooks, which are critical materials for learning processes.

### ***Science Education and Textbooks***

Textbooks are sources of information and essential teaching tools students benefit from during their school years (Liu & Khine, 2016). Almost seven in ten teachers of primary school fourth-grade students use textbooks as primary sources of information (65%), while the rest use them as complementary sources (35%) (Mullis et al., 2008). Therefore, the accuracy and quality of the content of textbooks are critical for the effectiveness of educational processes (Liu & Khine, 2016).

Multimodality in textbooks allows designers to use different epistemological positions and learning theories (Bezemer & Kress, 2010). All representations have different meanings, essential aspects, and limitations (Wellington & Osborne, 2001). From the point of view of science education, the interaction of verbal and visual elements in textbooks promotes learning and develops interpersonal meaning (Koutsikou et al., 2021). Verbal text and visual association should help students participate actively and gain familiarity with the content of teaching materials (Koutsikou et al., 2021). From this point of view, one mode (writing, procedural type, etc.) may emphasize a transferring learning-teaching approach, another (visual, concept cartoon, etc.) may highlight the constructivist approach, while another may emphasize inductively and other deductive learning processes (Bezemer & Kress, 2010). At this point, it is necessary to look at the process of creating meaning in science education in the multimodal structure created by the semantic relationship between verbal and visual modes (Tang, 2021). The harmony and cooperation between verbal and visual modes help students



make sense of multimodal science materials (Koutsikou et al., 2021). We should consider the educational function of visuals rather than their aesthetic and decorative functions before we use them to discover their potential as learning tools (Postigo & López-Manjón, 2019). Representations in science textbooks determine which representations teachers use in their lectures and how they use them (Bergqvist & Chang Rundgren, 2017). Therefore, we should analyze how multiple representations are integrated into textbooks.

Many researchers focus on science textbooks (İnaltekin & Göksu, 2019; Khine & Liu, 2017; Liu & Khine, 2016; Liu & Treagust, 2013). Vojří and Rusek (2019) determined that it was mostly American researchers who examined science textbooks, followed by Turkish researchers. For example, Turkish researchers address the scientific process skills (Bayir & Kahveci, 2022), scientific content (Yılmaz et al., 2021), scientific process, life, and engineering skills (Ecevit et al., 2022), nature of science components (Duruk & Akgün, 2020; Uluçınar Sağır & Soylu, 2021), learning approaches (Sarioğlu et al., 2016), assessment and evaluation approaches (Köse, 2021), analogies (Kıvanç & Aydın, 2021; Köse, 2022), and cultural elements (Guvendi, 2021) in science textbooks.

Eroğlu Doğan et al. (2020) argue that most Turkish researchers assess science textbooks in terms of content but rarely analyze them in terms of style, language, and expression criteria. Vojří and Rusek (2019) observe that most researchers focus on the content of science textbooks. On the other hand, there has been a growing body of research into the multiple representations in textbooks because they make texts more appealing to teachers (Vojří & Rusek, 2019). However, there is little research on the visual-verbal elements in textbooks (Tang, 2022), as most researchers concentrate solely on the titling and indexing of representations (Khine & Liu, 2017; Slough et al., 2010). In other words, researchers have understudied in what context/discourse representations are used in textbooks and how they support one another concerning texts (Tang, 2022). Moreover, researchers who examined the relationship between visuals and texts in the context of genre analysis focused chiefly on secondary school (Tang, 2022) and preschool (Koutsikou et al., 2021) textbooks.

Most researchers examine secondary school textbooks, and there are fewer studies on primary school science textbooks than their secondary school counterparts (Eroğlu Doğan et al., 2020; Vojří & Rusek, 2019). Postigo and López-Manjón (2019) examined the biology topics in primary and secondary school science textbooks in Spain and concluded that the educational type did not matter. This suggests we need more species analysis to investigate multiple representations in primary school science textbooks. Moreover, educational genres in learning processes vary across countries depending on their national education systems (Foster & Russell, 2002). In this context, Turkish researchers who focus on multiple representations in science textbooks examine the distribution of representations in secondary school textbooks (Şantaş, 2017). Barış et al. (2020) conclude that representations appeal to specific topics limited by textual connection and titling. Researchers also concentrate on the distribution of representations at different grade levels (İnaltekin & Göksu, 2019) and review them in terms of visual design principles limited by photograph and drawing elements (Shahinpoor & Alpan, 2021). We can argue that researchers turn a blind eye to the “scientific genre” dimension regarding the use of representations. Therefore, we think that our results will provide important information regarding the status of science textbooks in Türkiye.

### ***Research Objective***

This study aimed to investigate the multiple representations in primary school science textbooks within the context of the scientific genre. We think this study will present important results given the effect of multimodality on learning and the importance of scientific genres and representations. The following are the research questions:

1. What representations are used in primary school science textbooks?
2. What is the distribution of the representations in primary school science textbooks regarding the subject area and grade level?

3. What is the distribution of the scientific genre with which the representations are associated?
4. What is the distribution of the representations and scientific genres across chapters in the textbooks?

## METHOD

This study adopted a document analysis model, a qualitative research approach involving the systematic examination or evaluation of printed and digital materials (Bowen, 2009).

### Research Material

The research materials were two science textbooks (third and fourth grades) published by the Ministry of National Education in accordance with the decision of the Ministry of National Education Board of Education and Discipline (Date: 25.07.2018 & No: 99) for the 2021-2022 academic year. This study focused on those textbooks because they were prepared in collaboration with academics.

### Data Collection Tools

The data were collected using a content review form developed by the researchers. The form was used to determine the multiple representations in the textbooks and the scientific genre with which they were associated. The form consisted of three parts. The first part focused on the variables of “grade level,” “unit,” and “analysis unit.” The second part addressed the representations in the textbooks. The third part focused on the variables of the “scientific genre.” The frameworks developed by Tang (2022) were used to examine the representations and scientific genres in the textbooks (Tables 1 and 2). Unlike Tang (2022), we also focused on “concept cartoons” within the framework of the types of representations in the textbooks. Inter-rater coefficient reliability stated in the following section can provide an idea about the validity and reliability of the form.

**Table 1** Framework for Coding Multiple Representations in Textbooks

Representation Type	Features
Photograph	A realistic image of an object taken with an optical camera
Diagram	Hand-drawn or computer-generated graphs that show the objects’ physical properties (shape, size, parts, and relationships). Diagrams are iconic (images look like the object they represent); They may be schematic (images are symbolic or fictitious) or both.
Network graph	It is a graph showing the conceptual and qualitative relationships between visual components (geometric shapes, lines, and words), e.g., flowchart, decision tree, mind map, Venn diagram.
Graph	It is a type of representation that shows quantitative information through the position and size of visual components.
Map	Graph showing layered information about specific locations on Earth
Table	Organized arrangement and display of words, numbers, or symbols to emphasize their relationship
Equation	Symbolic expression, including scientific notation and algebraic symbols
Scientific image	Images by specialized scientific equipment, such as X-ray, electron microscope, etc.
Diagram + photo mix	A hybrid combination of adjacent or superimposed diagrams and photographs.
Table+image mix	A hybrid combination of images (photos or diagrams) embedded in a table, for example, used together within one of the cells.
Concept Cartoons	While characters generate alternative ideas about the scientific aspect of a situation, students are invited to discuss with the character in the cartoon (Keogh et al., 1998).

Note. Revised from Distribution of visual representations across scientific genres in secondary science textbooks: Analysing multimodal genre pattern of verbal-visual texts by K. S. Tang (2022).

**Table 2** Framework for the Coding of Scientific Genres with Which Representations in Textbooks Are Associated

Genre	Features
Information report	Purpose: Organizing information on events and objects Stages: Identification, explanation, and classification Linguistic features: <ul style="list-style-type: none"> <li>• Frequent use of relation clauses</li> <li>• Sentences are often not in order</li> </ul>
Explanation	Purpose: Explaining the underlying causes or processes of a known phenomenon Stages: Case identification, sequencing, and generalization Linguistic features: <ul style="list-style-type: none"> <li>• Frequent use of conjunctions (e.g., because, if)</li> <li>• Sentences are ordered according to the temporal or causal logic of events</li> </ul>
Experimental	Purpose: Presenting the stages and results of an experiment Stages: Goal, stages, and results Linguistic features: <ul style="list-style-type: none"> <li>• Frequent use of behavioral sentences centered on the reader or experimenter (e.g., holding the apparatus, magnet, etc.)</li> <li>• Frequent use of a numeric system or bullet points</li> <li>• Sentences are ordered according to the procedural steps required to perform an experiment.</li> </ul>
Argumentative	Purpose: Providing evidence that confirms or refutes an arguable claim Stages: thesis, proof, and discussion Linguistic features: <ul style="list-style-type: none"> <li>• Suggesting predictions or hypotheses (e.g., believing, suggesting, etc.) rather than objective statements may suggest</li> <li>• In some sentences, the subject is clear (for example, scientists believe...)</li> <li>• Sentences are ordered according to the temporal or causal logic of events.</li> </ul>
Technical Procedure	Purpose: Instructing readers on how to perform a task or procedure Stages: task and method Linguistic features: <ul style="list-style-type: none"> <li>• Frequent use of reader- or practitioner-centered behavioral sentences (write, balance, etc.)</li> <li>• Frequent use of personal pronouns (you can, you will, etc.)</li> <li>• Sentences are ordered according to the procedural steps of an operation</li> </ul>
Narrative	Purpose: Relating the biographies of past or contemporary scientists; stories of recent news or historical events Stages: Orientation and event recording Linguistic features: <ul style="list-style-type: none"> <li>• Names of people are clear in most sentences</li> <li>• Frequent use of action phrases (seeking, performing, etc.)</li> <li>• Sentences are usually in chronological order.</li> </ul>

Note. From Distribution of visual representations across scientific genres in secondary science textbooks: Analysing multimodal genre pattern of verbal-visual texts by K. S. Tang (2022).

### Analysis Unit

The analysis unit was the “representations” and the texts with which they were associated. The analysis unit excluded decorative images, warnings about safety precautions, and the same cartoonish characters and their speech bubbles in the textbooks. This study focused on texts and their educational function to identify the representations' scientific genres. It was determined that one representation was used in some scientific genres, while more than one representation was used in others. In this case, the entire group of representations was regarded as one representation. In the third-grade textbook, the headings "Chapter," "What We Have Learned," and "Do You Know?" were assessed within the scope of the “main text” part. The titles "Let's Do It Together" and "It is Your Turn" were assessed within the scope of the “activity” part. The contents under the title of "Unit Evaluation Test" were assessed within the scope of the “measurement and evaluation” part. In the fourth-grade science textbook, "Chapter," "Let's Know This," "Shaping the Future," and "Let's Repeat What We Learned" were assessed within the scope of the “main text” part. "Let's Explore Together," "Think, Write and Share," "Let's Try Ourselves," and "If You Were the Narrator" were assessed within the scope of the “activity” part. The contents under the title of "Unit Evaluation Questions" were examined within the scope of the “measurement and evaluation” part.

## Data Analysis

Descriptive statistics were used to analyze the representations and scientific genres in the textbooks. To check reliability, a researcher coded two randomly representative samples from each unit at the third and fourth-grade levels and the related text. The inter-rater reliability coefficient was calculated. The representations and scientific genres had a Cohen's Kappa coefficient of .936 and .819, respectively. According to the reference interval suggested by Landis and Koch (1977) for Kappa statistics, both representations and scientific genres had high reliability.

## RESULTS

### The Distribution of the Representations in Science Textbooks

The distribution of the representations in science textbooks was examined by grade level, subject area, and unit. Firstly, the distribution of representations by grade level was presented. Table 3 shows the distribution of the representations by grade level.

**Table 3** Distribution of Representations by Grade Level

Grade Level	f	Representations									
		Photograph	Iconic diagram	Symbolic diagram	Table	Network graph	Graph	Diagram + photo	Tables+ images	Concept cartoon	Map
3	668 (60%)	384 57.5%	204 30.5%	22 3.3%	17 2.5%	14 2.1%	2 0.3%	14 2.1%	3 0.4%	3 0.4%	5 0.7%
4	449 (40%)	251 55.9%	87 19.4%	28 6.2%	38 8.5%	24 5.3%	1 0.2%	14 3.1%	6 1.3%	0 0.0%	0 0.0%
Total	1117	635 56.8%	291 26.1%	50 4.5%	55 4.9%	38 3.4%	3 0.3%	28 2.5%	9 0.8%	3 0.3%	5 0.4%

The textbooks had 1117 representations (Table 3). The most common representations were photographs (56.8%) and iconic diagrams (26.1%), followed by symbolic diagrams, tables, network graphs, graphs, diagrams + photographs, tables + images, and concept cartoons. However, the textbooks had no scientific images or equation representations.

The third-grade textbook had more than half of the total representations (60%). The third-grade textbook had 384 photographs (57.5%), while the fourth-grade textbook had 251 photographs (55.9%). The third-grade textbook (30%) had more iconic diagrams than the fourth-grade textbook (19.4%). On the other hand, the fourth-grade textbook had more symbolic diagrams (6.2%), tables (8.5%), network graphs (5.3%), diagrams + photographs (3.1%), and tables + visuals (1.3%) than the third-grade textbook. The third-grade textbook had three concept cartoons and five maps, whereas the fourth-grade textbook had none. Table 4 shows the distribution of the representations by subject area and unit.

**Table 4** Distribution of Representations by Subject Area and Unit

Subject area Units		f	%	Photograph	Iconic diagram	Symbolic diagram	Table	Network graph	Graph	Diagram + photo	Table + image	Concept cartoon	Map
Earth and Universe	Let's get to know our planet	49	4.3%	29	7	6	0	1	1	1	0	1	3
	Earth's crust and Earth's movements	46	4.1%	17	13	6	2	4	0	0	4	0	0
Creatures and Life	Our five senses	70	6.2%	48	15	3	0	0	1	1	1	1	0
	Our Food	49	4.3%	29	9	2	4	2	0	2	1	0	0
	Journey to the living world	84	7.5%	39	33	4	3	1	0	2	2	0	0
Physical phenomena	Human and environment	58	5.1%	43	3	9	1	1	0	1	0	0	0
	Let's get to know the force	77	6.8%	43	22	2	4	3	0	1	0	0	2
	Effects of the force	67	5.9%	32	20	5	5	4	0	1	0		
	Light and sounds around us	106	9.4%	75	19	2	2	4	0	4	0	0	0
	Lighting and sound technologies	87	7.7%	67	8	3	3	5	1	0	0	0	0
	Electric vehicles	173	15.4%	83	78	5	4	3	0	0	0	0	0
	Simple electrical circuits	32	2.8%	14	10	2	1	1	0	3	1	0	
Matter and Nature	Let's get to know the substance	109	9.7%	67	30	0	4	2	0	5	0	1	0
	Properties of Matter	110	9.8%	49	24	1	22	7	0	7	0	0	0

The unit of “electric vehicles” in the subject area of “physical phenomena” had the highest number of representations (15.4%). The unit had 83 photographs and 78 iconic diagrams (Table 4).

### *The Distribution of Representations by Scientific Genres*

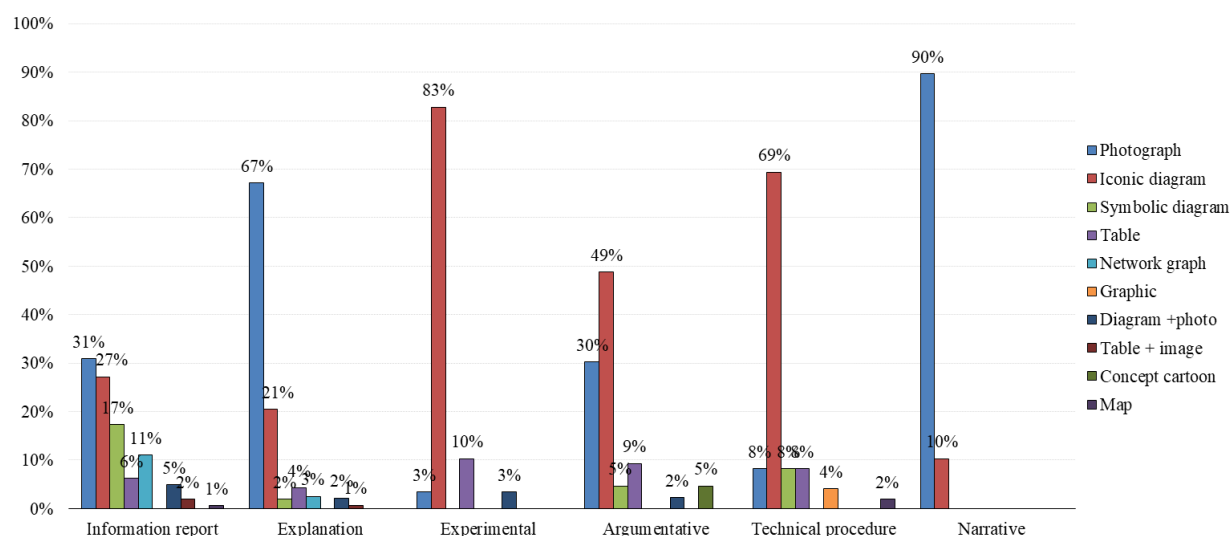
The distribution of representations and scientific genres in science textbooks was presented in two ways. Firstly, what scientific genres were associated to representations used in science textbooks were presented. Then scientific genres used in science textbooks were examined in terms of multiple representations. Table 5 shows the findings regarding what scientific genres were associated with representations used in science textbooks.

**Table 5** Representations by Scientific Genres

Representation	Grade Level	N	Information report	Explanation	Experimental	Argumentative	Technical procedure	Narrative
Photograph	3rd	384	29	342	1	2	4	6
	4th	251	21	199	0	11	0	20
	Total	635	50 (7.8%)	541 (85.1%)	1 (0.1%)	13 (2%)	4 (0.6%)	26 (4%)
Iconic diagram	3rd	204	34	135	8	10	14	3
	4th	87	10	30	16	11	20	0
	Total	291	44 (15%)	165 (57%)	24 (8%)	21 (7%)	34 (12%)	3 (1%)
Symbolic diagram	3rd	22	10	8	0	1	3	0
	4th	28	18	8	0	1	1	0
	Total	50	28 (56%)	16 (32%)	0	2 (4%)	4 (8%)	0
Table	3rd	17	3	10	1	-	3	0
	4th	38	7	24	2	4	1	0
	Total	55	10 (18%)	34 (61.8%)	3 (5.4%)	4 (7.2%)	4 (7.2%)	0
Network graph	3rd	14	6	8	-	-	-	0
	4th	24	12	12	-	-	-	0

	Total	38	18 (47%)	20 (53%)	-	-	-	0
Graph	3rd	2	0	-	2	-	-	0
	4th	1	0	1	-	-	-	0
	Total	3	0	1 (33%)	2 (67%)	-	-	0
Diagram + photo	3rd	14	6	7	1	-	-	0
	4th	14	2	11	0	1	-	0
	Total	28	8 (28.5%)	18 (64.2%)	1 (3.5%)	1 (3.5%)	-	0
Tables + images	3rd	3	1	2	-	-	-	0
	4th	6	2	4	-	-	-	-
	Total	9	3 (33%)	6 (67%)	-	-	-	-
Concept cartoon	3rd	3	-	1	-	2	-	-
	4th	-	-	-	-	-	-	--
	Total	3	-	1 (33%)	-	2 (67%)	-	-
Map	3rd	5	1	3	-	-	1	-
	4th	0	0	0	0	0	0	0
	Total	5	1 (20%)	3 (60%)	0	0	1 (20%)	0
Total		1117	162 (14%)	805 (72%)	29 (3%)	43 (4%)	49 (4%)	29 (3%)

Most representations were used in relation to “explanation” (72%), followed by “information report” (14%), “technical procedure” (4%), “argumentative” (4%), “experimental” (3%), and “narrative” (3%). Most photographs were associated with “explanation” (85.1%). More than half of the iconic diagrams were associated with “explanation” (57%), and the majority of the symbolic diagrams were associated with “information report” (56%). The larger part of the network graphs was associated with “explanation” (52.6%), and the graphs were associated with “experimental” (67%). While the diagrams + photographs were associated with “explanation” (64.2%); the tables + visuals were associated with “explanation” (67%). The greater part of the concept cartoons was associated with “argumentative” (67%). More than half of the maps were associated with “explanation” (60%). Figure 1 shows the distribution of the representations of the scientific genres in the textbooks.



**Figure 1** Distribution of Representations of Scientific Genres In Textbooks

“Information report,” “explanation,” and “narrative” were associated with photographs and iconic diagrams. “Experimental” was primarily associated with iconic diagrams and tables. “Argumentative” was predominantly associated with iconic diagrams and photographs. “Technical procedure” was mainly associated with iconic diagrams, followed by photographs, tables, and symbolic diagrams (Figure 1).

### The Distribution of Representations and Scientific Genres by Section

The distribution of representations and scientific genres by section was examined regarding use in the main text, activity, assessment and evaluation. Table 6 shows the distribution of the representations and scientific genres by section.

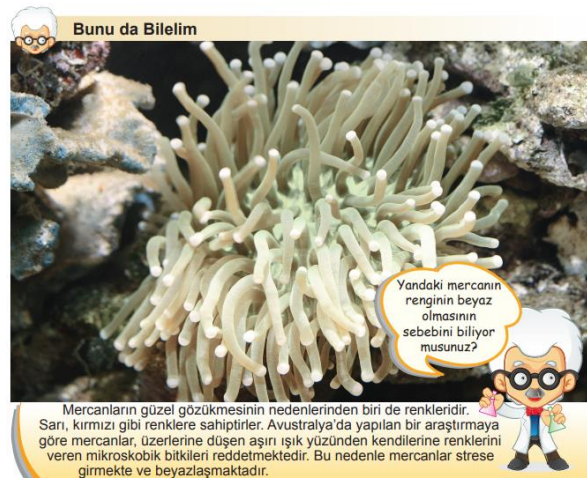
**Table 6** The Distribution of Representations and Scientific Genres by Section

Representation	Grade Level	Scientific Genre					
		Information report	Explanation	Experimental	Argumentative	Technical procedure	Narrative
Photograph	Main text	50	442 (84%)*	-	10	-	25
	Activity	-	51	1	-	4	1
	Assessment and evaluation	-	48	-	3	-	-
Iconic diagram	Main text	24	103 (74%)*	-	9	-	3
	Activity	19	42	24	10	34	-
	Assessment and evaluation	1	20	-	2	-	-
Symbolic diagram	Main text	10 (48%)*	10 (48%)*	-	1	-	-
	Activity	5	-	-	1	4	-
	Assessment and evaluation	13	6	-	-	-	-
Table	Main text	4	-	-	-	-	-
	Activity	2	19 (66%)*	3	1	4	-
	Assessment and evaluation	4	15	-	3	-	-
Network graph	Main text	6	4	-	-	-	-
	Activity	6	14 (70%)*	-	-	-	-
	Assessment and evaluation	6	2	-	-	-	-
Graph	Main text	-	-	-	-	-	-
	Activity	-	-	-	-	2 (100%)*	-
	Assessment and evaluation	-	1	-	-	-	-
Diagram + photo	Main text	8	10 (56%)*	-	-	-	-
	Activity	-	6	1	-	-	-
	Assessment and evaluation	-	2	-	1	-	-
Tables + images	Main text	3 (60%)*	2	-	-	-	-
	Activity	-	2	-	-	-	-
	Assessment and evaluation	-	2	-	-	-	-
Concept cartoon	Main text	-	-	-	2 (100%)*	-	-
	Activity	-	-	-	-	-	-
	Assessment and evaluation	-	1	-	-	-	-
Map	Main text	1	1	-	-	-	-
	Activity	-	2 (67%)*	-	-	1	-
	Assessment and evaluation	-	-	-	-	-	-
Total		162	805	29	43	49	29

\*The highest percentage of scientific genres in the unit with the highest number of representations

The main text sections of the textbooks had 527 photographs (83%), 139 iconic diagrams (48%), 21 symbolic diagrams (42%), 18 diagrams + photographs (64%), five tables + images (56%), and two concept cartoons (67%). The high-level activity sections of the textbooks had 29 tables (53%), 20 network graphs (53%), two graphs (67%), and three maps (60%).

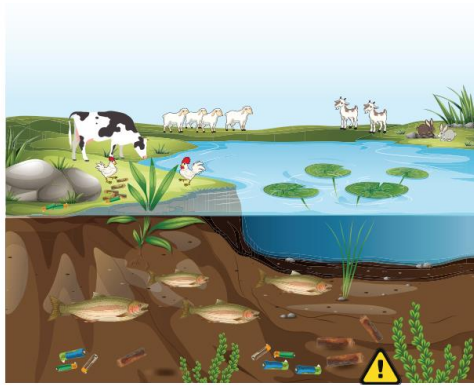
Photographs were the most common representations. They were mainly associated with “explanation” in the main text (84%). Figure 2 shows a photograph associated with the scientific genre of “explanation” in the main text section.



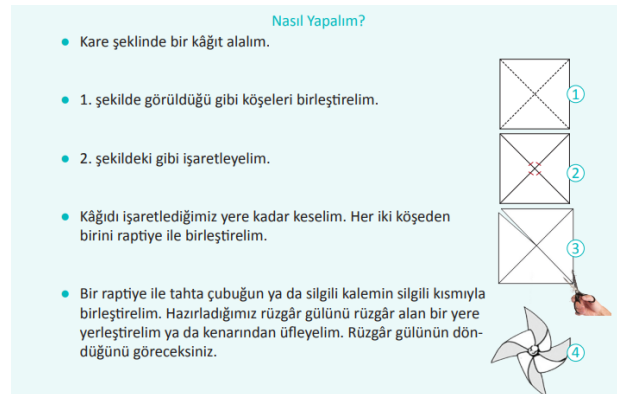
**Figure 2** A Photograph Associated With The Scientific Genre of “Explanation” In The Main Text Section

*Note.* Primary School Science 4th Grade Textbook, Ministry of National Education (MoNE) Publications, Lighting and Sound Technologies Unit (Physical Phenomena subject area)

Figure 2 shows corals and explains why they are white. The photograph is used to show “what” is explained. The question of “what” about the learning object in the “main text” section is answered with a photograph representation since it is a real-life image. Most iconic diagrams were also associated with “explanation” in the main text (74%). They were also used extensively in the activity section following the main text. However, the scientific genres in the activity section had different functions than those in the main text. Figure 3 shows how an iconic diagram is used differently in the “main text” (explanation) and “activity” (technical procedure) sections.



a



b

**Figure 3** Example of the Use of an Iconic Diagram Differently in the Main Text and Activity Sections

*Note.* Primary School Science 3rd Grade Textbook MoNE Publications, <sup>a</sup> Electric Vehicles, and <sup>b</sup> Let's Get to Know Our Planet Units



In Figure 3a, the iconic diagram explains how the direct disposal of waste batteries affects living things. In this example, the iconic diagram is used to answer the question of "how," unlike the question of "what" in the photographic representation. In Figure 3b, the iconic diagram explains how to perform the steps of a process. Both iconic diagrams are used to answer the question of "how."

Symbolic diagrams were associated with "information report" throughout the textbooks. They were associated with "information report" (48%) and "explanation" (48%) in the "main text" section. Diagrams + photographs were associated with "explanation" in the "main text" section (56%). Tables (66%), network graphs (70%), and maps (67%) were associated with "explanation" in the "activity" section. All graphs were associated with "technical procedure" in the "main text" section. More than half of the tables + images were associated with "information report" in the "main text" section (60%). All concept cartoons were associated with "argument" in the "main text" section.

Tables were associated with "explanation" throughout the textbooks. They were primarily used in the "activity" section. Figure 4 shows a table associated with "explanation" in the "activity" section.

B) Aşağıdaki tabloda verilen olayların sebeplerini örnekteki boşluğa yazınız.

Olay	Sebebi
Dondurmanın erimesi	
Suyun donması	
Eritilmiş metallerin tekrar donması	
Erimiş tereyağının donması	Tereyağı çevreye ısı verir.
Kışın yaptığımız kardan adamın erimesi	
Tost yaparken kaşar peynirinin erimesi	

C) Aşağıdaki tabloda sıcaklıklar verilen iki madde arasındaki ısı alışverişini örnekteki gibi açıklayınız.

Çay	Oda
65 °C	30 °C
Çay odaya ısı verir. Maddelerin sıcaklıkları eşitleninceye kadar ısı alışverişi devam eder.	

Çorba	Kaşık
50 °C	15 °C

**Figure 4** Example of a Table Associated With Explanation in the Activity Section

*Note.* Primary School Science 4th Grade Textbook MoNE Publications, Properties of Matter Unit

In Figure 4, the table is used in an activity design where students are asked to explain the reasons for a scientific event through different examples. The table is used to reveal the cause-and-effect relationship.

## DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

This study focused on the scientific genres and representations in third- and fourth-grade science textbooks. The results show that the textbooks use photographs, iconic diagrams, and tables as representations. Liu and Khine (2016) argue that primary school students need more photos and pictures showing how scientific facts and entities appear in science education. Primary school science topics involving abstract concepts are challenging to teach, especially when it is not visible (Preston et al., 2022). The dominant use of realistic images in the textbook is most likely aimed to help the learners easily correlate the abstract scientific concept with the objects that can be found in real life (Nur'graha & Hermawan, 2020). Pictorial representations clarify and improve oral texts and sometimes convey information more clearly than oral texts (Edens & Potter, 2001). Photographs are correct representations and a mechanical record of reality against subjective interference (Bastide, 1990; Myers, 1990). Photos sometimes offer much detail, while diagrams allow the author to select and manipulate pieces (Myers, 1990).

Realistic iconic diagrams help students recognize the structures of physical systems unsuitable for visual inspection (Hegarty et al., 1996; Novick, 2006). Dimopoulos et al. (2003) maintain that

textbooks contain many photographs and iconic diagrams that present science subjects in a naturalistic, articulated, and contextualized way while remaining faithful to their real-life images. They also state that primary and secondary school textbooks have more realistic visuals than other representations because they are interested in introducing students to a familiar world to involve them in science education. Our result is consistent with the literature (Hatzinikita et al., 2008; Kurnaz et al., 2016; Liu & Treagust, 2013; Postigo & López-Manjón, 2019; Şantaş, 2017). For example, İnaltekin and Göksu (2019) found that primary and secondary school science textbooks in Türkiye mostly had diagrams. Akçay et al. (2020) also determined that secondary school science textbooks in Türkiye mostly used diagrams. Dimopoulos et al. (2003) reported that Greek primary school science textbooks had much more realistic visuals than other visuals. Tang (2022) also documented that secondary school science textbooks mostly contained photographs and diagrams. Similarly, Slough et al. (2010) found that the most common representations were photographs and diagrams. Lee (2010) focused on science textbooks taught in the USA between 1943 and 2005 and reported an increase in the number of iconic diagrams (especially photographs) in modern textbooks over the years (Lee 2010).

The third-grade textbook had more representations than the fourth-grade textbook. Besides, the third-grade textbook had more iconic diagrams than the fourth-grade textbook. However, the fourth-grade textbook had more symbolic diagrams, tables, network graphs, diagrams + photographs, and tables + visuals than the third-grade textbook. How many and what type of representations primary school science textbooks contain depends on the grade level. Research shows that first-grade science textbooks mostly contain iconic diagrams (Khine & Liu, 2017; Liu & Treagust, 2013). Dimopoulos et al. (2003) argue that there is a positive correlation between representations' number and abstraction level and the grade level, except for photographs and iconic diagrams. Older students are more ready to learn abstract concepts than their younger counterparts (Kapıcı & Savaşçı-Açıkalın, 2015).

Moreover, the characteristics of representations depend on students' age or success level (Pinto, 2002). Abstract relationships are depicted in symbolic diagrams without considering natural physical properties, which causes novice learners to have difficulty interpreting representations and deciding what is essential and what is not (Butcher, 2006). Therefore, we should assess how ready students are before deciding on the form of scientific communication. Due to the relatively weak mathematical background of primary school students, it is recommended to compare them with figurative visuals and with symbolic visuals and technical representations as the grade level increases (Pinto, 2002). Symbolic expressions are essential for teaching abstract science concepts (Akçay et al., 2020). In this context, the negative correlation between the number of visual representations in textbooks and the grade level may be because students accumulate more academic and abstract knowledge over the years (Dimopoulos et al., 2003). Research also shows a positive correlation between the number of representations in science textbooks and the grade level (Postigo & López-Manjón, 2019).

On the other hand, Liu and Khine (2016) and Khine and Liu (2017) reported that science textbooks introduced fewer iconic representations and more schematics, graphs, and tables as students moved on to the next grade. Coleman and Dantzler (2016) concluded a positive correlation between the types of representations in science textbooks and the grade level. Therefore, our results are consistent with the literature.

The unit "electric vehicles" had the highest number of representations. The subject area "physical phenomena" also had the highest number of representations because it had more units than other subject areas. However, the other units in the same subject area also had many representations. This may be because those units are suitable for realistic visuals (photograph, iconic diagram). Coleman and Dantzler (2016) investigated the frequency of graphical representations in science textbooks for children and determined that physics textbooks had the highest number of representations. Research also shows that physics textbooks contain more representations than others (Qasim & Pandey, 2017; Şantaş, 2017).

Our results showed that the representations in the textbooks were mainly associated with “explanation” and “knowledge report.” The most common representations (photographs, iconic diagrams, and tables) were associated with “explanation.” Science is based on descriptive and explanatory understanding, which offers a meaningful way of “knowing” that helps us think flexibly and answer the question of “why” (Newton et al., 2002). Illustrative drawings facilitate the cognitive processes necessary for meaningful learning as they help students select, organize, and integrate words and images into a coherent mental model (Mayer et al., 1995). Textbooks and scientific texts with implicit images showing only certain aspects of a topic only represent information, or worse, cause students to misinterpret it (Evagorou et al., 2015). According to Pozzer-Ardenghi and Roth (2004), photograph titles in textbooks should go beyond describing phenomena represented in photographs and provide readers with enough information to help them make a connection between texts and photographs and distinguish necessary and redundant details. Evagorou et al. (2015) argue that if we explain which features of a topic a visual focuses on or omits, we make the role of representation in the learning process visible to students.

Annotated drawings help readers connect visual and verbal representations and approach the material from a causal perspective, allowing inexperienced students to benefit from representations (Mayer et al., 1995). Bryce (2013) maintains that the texts and language structure of primary school science textbooks focus most on the main idea and details and then adopt an understanding of cause and effect. Dimopoulos et al. (2005) documented that the descriptive scientific genre was the most dominant in science textbooks. According to Pozzer-Ardenghi and Roth (2004), students first notice the most central objects in photographs in textbooks and pay attention to the learning objects in the photographs through photo captions. They read the text to relate it to the photographs and then go further and recognize the message in the representation. The fact that the representations in the textbooks are primarily associated with “information report” and “explanation” indicates that they are used effectively. This result is consistent with the literature. For example, Tang (2022) found that the representations in secondary school science textbooks were associated with “information report” and “explanation.” However, she also reported that there were more representations associated with “information report” than with “explanation,” probably because she focused on science textbooks at different grade levels. Green and Green (2000) argue that primary school students have less difficulty understanding descriptive texts than explanatory texts. Newton et al. (2002) stated that descriptive understanding was more dominant than explanatory understanding in primary school science textbooks. We can talk about a change in the way textbooks are designed because students are familiar with different types of texts, and therefore, manage them in a way they can use them in their own learning processes (Bryce, 2013). Some studies point to the effectiveness of writing in various scientific genres in science education (Keys, 1999; Pelger & Nilsson, 2015).

The results showed that photographs were the most common representations associated with “information report,” “explanation,” and “narrative,” while iconic diagrams were the most common representations associated with “experimental,” “argumentative,” and “technical procedure.” Tang (2022) focused on middle school science textbooks and reported the following results. Most photographs are associated with “information report” and “narrative.” Diagrams and photographs are associated with “explanation.” Diagrams are associated with “experimental.” Photographs are associated with “argumentative.” Equality is associated with “technical procedure.” The differences in results may be because we focused on textbooks at different grade levels.

The results showed that the photographs and iconic diagrams were primarily used in the “main text” section. There were also many iconic diagrams in the “activity” section. However, the scientific genre associated with the “activity” section varied because some photographs were used to answer the question of “what,” while others were used to answer the question of “how.” Our results also showed that most iconic diagrams were associated with “experimental” and “technical procedure.” Using real or realistic images to describe learning objects and explain causes and effects in the “main text” section makes sense. However, it is better to use realistic rather than real images in the “activity” section. The author or designer can have more control over diagrams than photographs and get the chance to emphasize different aspects of a topic (Tang, 2022). Akçay et al. (2020) determined that the

images in science textbooks were primarily used in the “main text” section. Pozzer-Ardenghi and Roth (2004) maintain that the main text is an essential cognitive source that students use to interpret photographs.

The primary school third- and fourth-grade science textbooks have more photographs and iconic diagrams (realistic visuals) than conventional representations (graphs, network graphs, tables, maps, etc.). This result indicates that the textbooks do not contain diverse representations to improve representational fluency and visual literacy. İnaltekin and Göksu (2019) emphasize that teaching materials should help students develop visual literacy skills because they play a critical role in scientific literacy and international exams. Devetak and Vogrinc (2013) advocate that a good science textbook should encourage students to use different representations, especially conventional representations that activate high-level thinking skills. The realism, familiarity, and detail provided by photographs were utilized in association with “explanation” and “narrative” in the design process of the science textbooks. Iconic diagrams are modifiable representations that offer a perception of reality. This is why they were associated with the “experimental,” “technical procedure,” and “argumentative” genres. The results showed that different representations were used to construct the “information report” genre. Scientific genres and representations in textbooks can create a structure that includes multimodal types. Multimodal structures dominate the design of textbooks, which influence and are influenced by teacher-student interaction (Tang et al., 2022). Textbooks should contain different representations to help them synthesize information and use it in complex processes, such as scientific arguments (Donovan & Coleman, 2018). Therefore, science textbooks should be designed in such a way that they contain a variety of representations associated with scientific genres

## RECOMMENDATIONS

The results are sample-specific and cannot be generalized to all textbooks. It is necessary to carry out researches examining the textbooks of different publishers. Primary school science textbooks mostly have photographs and iconic diagrams as representations. Researchers should examine the photographs and diagrams in textbooks from different classifications (simple, analytic-synthetic, etc.). Authorities should revise the current textbooks and integrate more representations and scientific genres into them. They should design scientific genres to utilize the advantages of different types of representations. In this study, there was no examination of the quality of representations used in textbooks, and it is recommended that new studies be conducted on this subject. Researchers should investigate how classroom teachers associate representations with scientific genres. They should also focus on the representations and scientific genres in mathematics, social studies, Turkish, and life studies textbooks.

**Conflicts of Interest:** No potential conflict of interest was declared by the author.

**Funding Details:** This study was not supported by any funding agency

**CRedit Author Statement:** Elif GÜVEN DEMİR: Conceptualization, Formal Analysis, Methodology, Investigation, Resources, Supervision, Validation, Writing – Review & Editing.

**Ethical Statement:** This study does not require ethics committee approval.

## REFERENCES

- Akçay, H., Kapıcı, H. O., & Akçay, B. (2020). Analysis of the representations in Turkish middle school science textbooks from 2002 to 2017. *Participatory Educational Research*, 7(3), 192-216. <https://doi.org/10.17275/per.20.42.7.3>
- Barış, G., Üner, S., & Akkuş, H. (2020). *Madde ve doğası konusunda fen bilimleri ders kitaplarında yer alan temsillerin incelenmesi* [Conference presentation abstract]. 2nd International Conference on Science, Mathematics, Entrepreneurship and Technology Education, Bursa.

<http://www.fmgtegitimikongresi.com/dosyalar/files/%C3%96zetler%20kitab%C4%B1%20V2.pdf>

- Bastide, F. (1990). The iconography of scientific texts: Principles of analysis. In M. Lynch & S. Woolgar (Eds.), *Representation in scientific practice* (pp.187-230). MIT Press.
- Bateman, J. (2014). Genre in the age of multimodality: Some conceptual refinements for practical analysis. In P. Evangelisti Allori, J. Bateman, & V. K. Bhatia (Eds), *Evolution in genre. Emergence, variation, multimodality* (pp. 237-269). Peter Lang.
- Bayir, E., & Kahveci, S. (2022). Ortaokul fen bilimleri ders kitaplarının bilimsel süreç becerileri açısından incelenmesi [Examination of secondary school science textbooks in terms of levels of inquiry- based teaching method]. *Cumhuriyet Uluslararası Eğitim Dergisi*, 11(1), 1295 - 1326. <https://doi.org/10.30703/cije.1026825>
- Bergqvist, A., & Chang Rundgren, S.-N. (2017). The influence of textbooks on teachers' knowledge of chemical bonding representations relative to students' difficulties understanding. *Research in Science & Technological Education*, 35(2), 215-237. <https://doi.org/10.1080/02635143.2017.1295934>
- Bezemer, J., & Kress, G. (2010). Changing text: a social semiotic analysis of textbooks. *Designs for Learning*, 3(1-2), 10-29. <http://doi.org/10.16993/dfl.26>
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27-40. <https://doi.org/10.3316/QRJ0902027>
- Bryce, N. (2013). Textual features and language demands of primary grade science textbooks: The call for more informational texts in primary grades. In M. Khine (Ed.), *Critical analysis of science textbooks, Evaluating instructional effectiveness* (pp. 101-120). Springer.
- Butcher, K. R. (2006). Learning from text with diagrams: promoting mental model development and inference generation. *Journal of Educational Psychology*, 98(1), 182-197. <https://doi.org/10.1037/0022-0663.98.1.182>
- Coleman, J. M., & Dantzler, J. A. (2016). The frequency and type of graphical representations in science trade books for children. *Journal of Visual Literacy*, 35(1), 24-41. <https://doi.org/10.1080/1051144X.2016.1198543>
- Devetak, I., & Vogrinc, J. (2013). The criteria for evaluating the quality of the science textbooks. In M. S. Khine (Ed.), *Critical analysis of science textbooks: evaluating instructional effectiveness* (pp. 3-15). Springer Netherlands. [https://doi.org/10.1007/978-94-007-4168-3\\_1](https://doi.org/10.1007/978-94-007-4168-3_1)
- Dimopoulos, K., Koulaidis, V., & Sklaveniti, S. (2003). Towards an analysis of visual images in school science textbooks and press articles about science and technology. *Research in Science Education*, 33, 189–216. <https://doi.org/10.1023/A:1025006310503>
- Dimopoulos, K., Koulaidis, V., & Sklaveniti, S. (2005). Towards a framework of socio-linguistic analysis of science textbooks: The Greek case. *Research in Science Education*, 35(2), 173-195. <https://doi.org/10.1007/s11165-004-8162-z>
- Donovan, C., & Coleman, J. (2018). Teaching teachers: The language of science in the reading and writing of student scientists. *Science and Children*, 56. 49-57. [https://doi.org/10.2505/4/sc18\\_056\\_01\\_62](https://doi.org/10.2505/4/sc18_056_01_62)

- Dressman, M. (2019). Multimodality and language learning. In M. Dressman & R. W. Sandler (Eds.), *The handbook of informal language learning* (pp. 39-55). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781119472384.ch3>
- Duruk, Ü., & Akgün, A. (2020). Bilimin doğası bileşenlerinin fen bilimleri ders kitaplarında temsil edilme durumu [Representation of Nature of Science Components Across Secondary School Science Textbooks]. *Amasya Education Journal*, 9(2), 196 - 229
- Ecevit, T., Alagöz, S., Özkurt, N., & Köylü, Ü. K. (2022). İlkokul 3. ve 4. sınıf fen bilimleri ders kitaplarındaki etkinliklerinin bilimsel süreç, yaşam ve mühendislik tasarım becerilerini kazandırması açısından incelenmesi [Investigation of the activities in elementary school 3rd and 4th grade science course books in terms of achieving scientific process, life and engineering design skill]. *Trakya Journal of Education*, 12(2), 743 - 758. <https://doi.org/10.24315/tred.934470>
- Edens, K. M., & Potter, E. F. (2001). Promoting conceptual understanding through pictorial representation. *Studies in Art Education*, 42(3), 214-233. <https://doi.org/10.2307/1321038>
- Eroğlu Doğan, E., Ekinci, R., & Doğan, D. (2020). Fen bilimleri ders kitapları ile ilgili yapılan çalışmaların incelenmesi [Examination of the studies related to science textbooks]. *Journal of the Human and Social Sciences Researches*, 9(5), 3479-3499. <https://doi.org/10.15869/itobiad.734864>
- Evagorou, M., Erduran, S., & Mäntylä, T. (2015). The role of visual representations in scientific practices: From conceptual understanding and knowledge generation to ‘seeing’ how science works. *International Journal of STEM Education*, 2(1), 11. <https://doi.org/10.1186/s40594-015-0024-x>
- Foster, D., & Russell, D. R. (2002). *Writing and learning in cross-national perspective: transitions from secondary to higher education*. National Council of Teachers of English, 1111 W. <https://eric.ed.gov/?id=ED463557>
- Green, C., & Green, S. (2000). *Assessment of literacy in the text level strand of the national literacy framework at key stage two: issues surrounding genre and gender* [Conference Presentation]. European Conference on Educational Research, Edinburg. <https://www.cambridgeassessment.org.uk/Images/109662-assessment-of-literacy-in-the-test-level-strand-of-the-national-literacy-framework-at-key-stage-two-issues-surrounding-genre-and-gender.pdf>
- Güvendi, M. F. (2021). İlkokul fen bilimleri ders kitaplarında yer alan kültürel öğelerin incelenmesi [Examination of cultural elements in primary school science textbooks]. *Değerler Eğitimi Dergisi*, 19(42), 9-37. <https://doi.org/10.34234/ded.895236>
- Hatzinikita, V., Dimopoulos, K., & Christidou, V. (2008). PISA test items and school textbooks related to science: A textual comparison. *Science Education*, 92, 664-687. <https://doi.org/10.1002/sce.20256>
- Hegarty, M., Carpenter, P. A., & Just, M. A. (1996). Diagrams in the comprehension of scientific texts. In R. Barr, M. L. Kamil, P. B. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (pp. 641-668), Routledge.
- Hiippala, T. (2014). Multimodal genre analysis. In C. D. Maier & S. Norris (Eds.), *Interactions, images and texts: a reader in multimodality* (pp. 111-123). de Gruyter Mouton. <https://doi.org/10.1515/9781614511175.111>

- Hildebrand, G. M. (1996). *Writing in/forms science and science learning* [Conference Presentation] the Annual Meeting of the National Association for Research in Science Teaching. St. Louis. United States. <https://files.eric.ed.gov/fulltext/ED393694.pdf>
- İnaltekin, T., & Göksu, V. (2019). A research on visual learning representations of primary and secondary science textbooks in Turkey. *International Journal of Progressive Education*, 15(6), 51-65. <https://doi.org/10.29329/ijpe.2019.215.4>
- Jong, T. de, Ainsworth, S., Dobson, M., Hulst, A. van der, Levonen, J., Reimann, P., Sime, J. A., Someren, M. van, Spada, H., & Swaak, J. (1998). Acquiring knowledge in science and mathematics: The use of multiple representations in technology based learning environments. In M. W. van Someren, P. Reimann, & H. P. A. Boshuizen (Eds.), *Learning with multiple representations* (pp. 9-40). Pergamon Elsevier. <https://research.utwente.nl/en/publications/acquiring-knowledge-in-science-and-mathematics-the-use-of-multipl>
- Kapıcı, H. Ö., & Savaşçı-Açıklan, F. (2015). Examination of visuals about the particulate nature of matter in Turkish middle school science textbooks. *Chemistry Education Research and Practice*, 16(3), 518-536. <https://doi.org/10.1039/C5RP00032G>
- Keogh, B., Naylor, S., & Wilson, C. (1998). Concept cartoons: A new perspective on physics education. *Physics Education*, 33(4), 219-224. <https://doi.org/10.1088/0031-9120/33/4/009>
- Keys, C. W. (1999). Revitalizing instruction in scientific genres: Connecting knowledge production with writing to learn in science. *Science Education*, 83(2), 115-130. [https://doi.org/10.1002/\(SICI\)1098-237X\(199903\)83:2<115::AID-SCE2>3.0.CO;2-Q](https://doi.org/10.1002/(SICI)1098-237X(199903)83:2<115::AID-SCE2>3.0.CO;2-Q)
- Khine, M., & Liu, Y. (2017). Descriptive analysis of the graphic representations of science textbooks. *European Journal of STEM Education*, 2(3), 06. <https://doi.org/10.20897/ejsteme/81285>
- Kıvanç, Z., & Aydın, A. (2021). 7. sınıf fen bilimleri ders kitabında kimya kavramlarına yönelik analogilerin tespiti [Determination of analogies for the chemistry concepts in the 7 th grade science textbook]. *Journal of Turkish Chemical Society Section C: Chemistry Education*, 6(1), 93-196. <https://doi.org/10.37995/jotcsc.895226>
- Koutsikou, M., Christidou, V., Papadopoulou, M., & Bonoti, F. (2021). Interpersonal meaning: verbal text-image relations in multimodal science texts for young children. *Education Sciences*, 11(5), 245. <https://doi.org/10.3390/educsci11050245>
- Köse, M. (2021). Ortaokul fen bilimleri ders kitaplarının ölçme ve değerlendirme açısından incelenmesi [Analysis of secondary school science textbooks in terms of measurement and evaluation]. *Erzincan University Journal of Education Faculty*, 23(2), 316-334. <https://doi.org/10.17556/erziefd.738444>
- Köse, M. (2022). Fen bilimleri ders kitaplarındaki analogilerin değerlendirilmesi [Evaluation of analogies in science textbooks]. *Cumhuriyet International Journal of Education*, 11(1), 112-126. <https://doi.org/10.30703/cije.955701>
- Kress, G. R. (2003). *Literacy in the new media age*. Psychology Press.
- Kurnaz, M. A., Çevik, E. E., & Bayri, N. G. (2016). Fen ve teknoloji ders kitaplarındaki gösterim türleri arası geçişlerin incelenmesi [Investigation of transitions between multiple representations in the science textbooks]. *Cumhuriyet International Journal of Education*, 5(3), 31-47. <https://doi.org/10.30703/cije.321405>

- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159-174. <https://doi.org/10.2307/2529310>
- Lee, V. R. (2010). Adaptations and continuities in the use and design of visual representations in US middle school science textbooks. *International Journal of Science Education*, 32(8), 1099-1126. <https://doi.org/10.1080/09500690903253916>
- Lemke, J. (1998). Multiplying meaning: In J. R. Martin & R. Veel (Eds.), *Reading Science*. Routledge.
- Liu, Y., & Khine, M. S. (2016). Content analysis of the diagrammatic representations of primary science textbooks. *EURASIA Journal of Mathematics, Science and Technology Education*, 12(8). <https://doi.org/10.12973/eurasia.2016.1288a>
- Liu, Y., & Treagust, D. F. (2013). Visual and verbal semiotics in scientific text. Content analysis of diagrams in secondary school science textbooks. In M. S. Khine (Ed.), *Critical analysis of science textbooks: Evaluating instructional effectiveness* (pp. 287-300). Springer Netherlands. [https://doi.org/10.1007/978-94-007-4168-3\\_14](https://doi.org/10.1007/978-94-007-4168-3_14)
- Mayer, R. E., Steinhoff, K., Bower, G., & Mars, R. (1995). A generative theory of textbook design: Using annotated illustrations to foster meaningful learning of science text. *Educational Technology Research and Development*, 43(1), 31-41. <https://doi.org/10.1007/BF02300480>
- Mills, K. A., & Unsworth, L. (2017). Multimodal literacy. In *Oxford research encyclopedia of education* (pp.1-29). Oxford University Press. <https://acuresearchbank.acu.edu.au/item/89v27/multimodal-literacy>
- Mullis, I. V. S., Martin, M. O., Fishbein, B., Foy, P., & Moncaleano, S. (2021). *Findings from the TIMSS 2019 problem solving and inquiry tasks*. Boston College. <https://timssandpirls.bc.edu/timss2019/psi/>
- Mullis, I. V. S., Martin, M. O., Foy, P., Olson, J. F., & Preuschoff, C. (2008). *TIMSS 2007 international mathematics report: Findings from IEA's trend in international mathematics and science study at the fourth and eighth grades*. TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College.
- Myers, G. (1990). Every picture tells a story: Illustrations in E.O. Wilson's Sociobiology. In M. Lynch & S. Woolgar (Eds.), *Representation in scientific practice* (pp.235-269). MIT Press.
- Newton, L., Newton, D., Blake, A., & Brown, K. (2002). Do primary school science books for children show a concern for explanatory understanding? *Research in Science & Technological Education*, 20, 227-240. <https://doi.org/10.1080/0263514022000030471>
- Novick, L. R. (2006). The importance of both diagrammatic conventions and domain-specific knowledge for diagram literacy in science: The hierarchy as an illustrative case. In D. Barker-Plummer, R. Cox, & N. Swoboda (Eds.), *Diagrammatic representation and inference* (pp. 1-11). Springer. [https://doi.org/10.1007/11783183\\_1](https://doi.org/10.1007/11783183_1)
- Nur'graha, D. Z. M., & Hermawan, B. (2020). What do the pictures say in a science textbook?. In *4th International Conference on Language, Literature, Culture, and Education (ICOLLITE 2020)* (pp. 164-171). Atlantis Press.
- Park, J., Chang, J., Tang, K.-S., Treagust, D. F., & Won, M. (2020). Sequential patterns of students' drawing in constructing scientific explanations: Focusing on the interplay among three levels of pictorial representation. *International Journal of Science Education*, 42(5), 677-702. <https://doi.org/10.1080/09500693.2020.1724351>



- Pelger, S., & Nilsson, P. (2016). Popular science writing to support students' learning of science and scientific literacy. *Research in Science Education*, 46(3), 439-456. <https://doi.org/10.1007/S11165-015-9465-Y>
- Pinto, R. (2002). Introduction to the Science Teacher Training in an Information Society (STTIS) project. *International Journal of Science Education*, 24, 227-234. <https://doi.org/10.1080/09500690110078888>
- Postigo, Y., & López-Manjón, A. (2019). Images in biology: Are instructional criteria used in textbook image design? *International Journal of Science Education*, 41(2), 210-229. <https://doi.org/10.1080/09500693.2018.1548043>
- Pozzer-ardenghi, L., & Roth, W. (2004). *Students' Interpretation of Photographs in High School Biology Textbooks* (pp.1-37). National Association for Research in Science Teaching, Vancouver.
- Preston, C. M., Hubber, P. J., & Xu, L. (2022). Teaching about electricity in primary school multimodality and variation theory as analytical lenses. *Research in Science Education*, 52(3), 949-973. <https://doi.org/10.1007/s11165-022-10047-9>
- Qasim, S. H., & Pandey, S. S. (2017). Content analysis of diagrammatic representations in upper primary science textbooks. *International Journal of Research - Granthaalayah*, 5(7), 474-479. <https://doi.org/10.5281/zenodo.838939>
- Salloum, S. (2021). Intertextuality in science textbooks: Implications for diverse students' learning. *International Journal of Science Education*, 43(17), 2814-2842. <https://doi.org/10.1080/09500693.2021.1992530>
- Sarioğlu, A. B., Can, Y., & Gedik, İ. (2016). 6. Sınıf fen bilimleri ders kitabındaki etkinliklerin araştırma-sorgulamaya dayalı öğrenme yaklaşımına uygunluğunun değerlendirilmesi [The assessment of the suitability of the activities in 6th grade science coursebooks for inquiry based learning approach]. *Abant İzzet Baysal University Journal of Faculty of Education*, 16(3), 1004-1025. <https://doi.org/10.12738/>
- Shahinpoor, S., & Alpan, G. B. (2021). Evaluation of textbooks in Turkey and Iran: Visual elements, page layout and cover designs. *e-Kafkas Journal of Educational Research*, 8(2), 255-280. doi:10.30900/kafkasegt.931939
- Slough, S. W., McTigue, E. M., Kim, S., & Jennings, S. K. (2010). Science textbooks' use of graphical representation: A descriptive analysis of four sixth grade science texts. *Reading Psychology*, 31(3), 301-325. <https://doi.org/10.1080/02702710903256502>
- Şantaş, H. K. (2017). *Çoklu modsal betimlemelerin kullanımının 5,6,7 ve 8. Sınıf fen bilimleri ders kitapları fizik ve biyoloji konuları için incelenmesi* [Unpublished master dissertation]. Akdeniz University. <http://acikerisim.akdeniz.edu.tr/xmlui/handle/123456789/3231>
- Tang, K. S. (2021). *Discourse strategies for science teaching and learning: research and practice*. Routledge. <https://doi.org/10.4324/9780429352171>
- Tang, K. S. (2022). Distribution of visual representations across scientific genres in secondary science textbooks: Analysing multimodal genre pattern of verbal-visual texts. *Research in Science Education*. <https://doi.org/10.1007/s11165-022-10058-6>
- Tang, K. S., Delgado, C., & Moje, E. B. (2014). An integrative framework for the analysis of multiple and multimodal representations for meaning-making in science education: integrative

- framework for analyzing representation. *Science Education*, 98(2), 305-326. <https://doi.org/10.1002/sce.21099>
- Tang, K. S., Park, J., & Chang, J. (2022). Multimodal genre of science classroom discourse: Mutual contextualization between genre and representation construction. *Research in Science Education*, 52(3), 755-772. <https://doi.org/10.1007/s11165-021-09999-1>
- Tang, K. S., & Rappa, N. A. (2020). The role of metalanguage in an explicit literacy instruction on scientific explanation. *International Journal of Science and Mathematics Education*, 19(7), 1311-1331. <https://doi.org/10.1007/s10763-020-10121-6>
- Tytler, R., & Prain, V. (2010). A framework for re-thinking learning in science from recent cognitive science perspectives. *International Journal of Science Education*, 32(15), 2055-2078. <https://doi.org/10.1080/09500690903334849>
- Uluçınar Sağır, Ş., & Soylu, Ü. İ. (2021). Investigation of the nature of science themes in seventh grade science textbooks: Force and energy unit. *Buca Faculty of Education Journal*, 52, 392-411. <https://doi.org/10.53444/deubefd.915828>
- Valeiras Jurado, J. (2012). Product presentations: A multimodal genre to be disclosed. *Forum de Recerca*. Universitat Jaume I. <http://hdl.handle.net/10234/77252>
- Valerías Jurado, J., & Ruiz-Madrid, M. N. (2015). A multimodal approach to product presentations. *Procedia - Social and Behavioral Sciences*, 173, 252-258. <https://doi.org/10.1016/j.sbspro.2015.02.061>
- Vojřt, K., & Rusek, M. (2019). Science education textbook research trends: A systematic literature review. *International Journal of Science Education*, 41(11), 1496-1516. <https://doi.org/10.1080/09500693.2019.1613584>
- Wellington, J., & Osborne, J. (2001). *Language and literacy in science education*. Open University Press.
- Xia, S. A. (2020). Genre analysis in the digital era: developments and challenges. *ESP Today Journal of English for Specific Purposes at Tertiary Level*, 8(1), 141-159. <https://doi.org/10.18485/esptoday.2020.8.1.7>
- Yeo, J., & Gilbert, J. K. (2017). The role of representations in students' explanations of four phenomena in physics: dynamics, thermal physics, electromagnetic induction and superposition. In D. F. Treagust, R. Duit, & H. E. Fischer (Eds.), *Multiple representations in physics education* (pp. 255-287). Springer International Publishing. [https://doi.org/10.1007/978-3-319-58914-5\\_12](https://doi.org/10.1007/978-3-319-58914-5_12)
- Yılmaz, M., Gündüz, E., Çimen, O., Karakaya, F., & Aslan, İ. (2021). An analysis of 6th grade science textbooks in terms of scientific content and learning outcomes. *e-Kafkas Journal of Educational Research*, 8(2), 101-122. <https://doi.org/10.30900/kafkasegt.947938>
- Yore, L. D., Hand, B., Goldman, S. R., Hildebrand, G. M., Osborne, J. F., Treagust, D. F., & Wallace, C. S. (2004). New directions in language and science education research. *Reading Research Quarterly*, 39(3), 347-352.

## Development of Turkish Speaking Anxiety Scale

**Mahmut Ayaz** <sup>i</sup>

Ministry of Education

**Süleyman Kasap** <sup>ii</sup>

Van Yüzüncü Yıl University

**Zafer Açar** <sup>iii</sup>

Bingöl University

### Abstract

This study aims to develop a Turkish speaking anxiety scale (TSAS) for secondary school students whose mother tongue is not Turkish. Likewise, our study aims to develop a measurement tool that will determine the effect of this difference on second language speaking anxiety, since the subjects of our study are individuals who do not receive education in their mother tongue but receive education in a second language. The scale, which was prepared during the scale development process, was applied to 368 8th grade students whose mother tongue was Kurdish and who learned Turkish later. The results of the exploratory factor analysis (EFA) showed that the 25 items in the scale were collected in three factors. These are: "Anxiety", "Reluctance" and "Inadequacy". This three-factor structure obtained as a result of the EFA analysis was confirmed by Confirmatory Factor Analysis (CFA). It is seen that these three factors contribute %43,923 to the total variance. It is seen that the factor load values of the items are between 0.375 and 0.746. Considering the item analysis results, it was concluded that the items in the scale were distinctive. In addition, as a result of ANOVA, it was revealed that students' Turkish speaking anxieties differed significantly in terms of gender, mother's knowledge of Turkish, and the language that parents wanted to be spoken at home. However, it was observed that there was no significant difference in the father's Turkish proficiency. The Cronbach's alpha reliability coefficients of this triple factor structure in the scale were calculated as 0.904, 0.829, and 0.733, respectively, and the alpha coefficient for all items of the scale was calculated as 0.927. As a result of the reliability and validity analyzes, it was concluded that the Turkish speaking anxiety scale is a reliable and valid measurement tool.

**Keywords:** Language Acquisition, Speech Anxiety, Bilingualism, Mother Tongue Education

**DOI:** 10.29329/ijpe.2023.534.11

**Submitted:** 09/09/2022

**Accepted:** 27/02/2023

**Published:** 01/04/2023

-----  
<sup>i</sup> **Mahmut Ayaz**, Dr., Department of Elementary Education, Ministry of Education

**Correspondence:** mahmutzaya@hotmail.com

<sup>ii</sup> **Süleyman Kasap**, Assoc. Prof. Dr., Department of English Language Education, Faculty of Education, Van Yüzüncü Yıl University, ORCID: 0000-0001-8367-8789

<sup>iii</sup> **Zafer Açar**, Assoc. Prof. Dr., Eastern Languages and Literature, Faculty of Science and Literature, Bingöl University, ORCID: 0000-0001-5323-9531

## INTRODUCTION

First language acquisition is a process that progresses in the form of first hearing and listening, making sense of what is heard, and putting it into speech. In the next process, the individual who acquires the first language also gains reading and writing skills through education. However, when it comes to second language acquisition or learning, a different process operates compared to the first language. Second language learning can vary according to the language learned, the region or country in which one lives, and the purpose of learning. For example, learning a second language in Turkey is a compulsory process, in the case of Kurds, mostly through learning in the school environment. There are several variables that affect a person's success in learning a second language. Among these, two important variables include neurophysiological difficulties due to the stabilization of the nervous system as a result of the loss of some brain plasticity and the genetic predisposition to language learning. However, many researchers have demonstrated that the factor that most influences second language learning is the emotional component, which includes other important variables such as motivation, interest, self-esteem, and anxiety. For example, according to Lazar (2000), how we perceive and receive new information is greatly influenced by our attitude to this information. Therefore, when we start learning a foreign language, our attitudes, expectations, and fears toward this language will influence our learning process. These feelings are mainly related to previous experiences that we have fixed in memory. Spielberger (1983) defined anxiety as a personal state of tension, worry, irritability, and worry about the stimulation of the autonomic nervous system (Zheng, 2008). May (1977), on the other hand, explained anxiety as an emotional response to a threat to some values, which is the basis of an individual's existence and personality (Bekleyen, 2004: 28). While discussions about the nature of anxiety, that is, whether it is learned or innate, the interpretation that this uncertainty at the conceptual level arises from two different situations was first put forward by Cattell and Scheier (1958), then Spielberger (1966) defined anxiety; divided into two as state and trait anxiety (Özusta, 1995). Later, with the increase in research on the subject, a third type was defined as situation-specific perspectives (Bekleyen, 2004: 28). In addition, anxiety has a positive feature by preparing the individual to take action to make a decision, and it has a negative feature as making decisions will take the person out of the comfort zone and uncertain results are disturbing. This distinction is defined as facilitating and debilitating anxiety" (Alkan, Bümen, and Uslu, 2019: 1159-1160).

Due to the effect of anxiety on human behavior, as Pichette (2019: 78) stated, there has been an increase in studies focusing on foreign language anxiety in the last twenty years. In particular, it was observed that the studies focused on speaking anxiety, which is one of the four basic components of language (speaking, writing, reading and listening).

Many studies reveal a negative relationship between anxiety and academic performance in foreign language learning (Pichette, 2009: 77; Bailey, Onwuegbuzie, & Daley, 2000; Chen & Chang, 2004; Horwitz, 2001; MacIntyre & Gardner, 1991; Phillips, 1992; Sparks and Ganschow, 2007; Young, 1999a). In addition, some theories have shown anxiety as an important variable in second language acquisition in their models and theories; Like Gardner's (1982) Social Education model, Karshen's (1982) Monitor Model, and Woodrow's (2006a) Adaptive Language Model (Pichette, 2009: 78).

Studies on language anxiety or anxiety about language components in Turkey are generally referred to as foreign language anxiety or second language anxiety. In their study, Polatcan, Alyılmaz and Er (2019: 387) cited Melanlıoğlu and Demir's (2013) adaptation study for the speaking anxiety of foreigners learning Turkish, Halat (2015), Maden, Dincel and Maden (2015), Erdil (2016), Şen & Boylu (2017), Karakuş Tayşi (2018) and Polatcan's (2019) adaptations study as examples. In addition, according to Alkan, Bümen, and Uslu, (2019: 1161), the level of speaking anxiety of students learning English (Çağatay, 2015; Tüm & Kunt, 2013) and the reasons for this anxiety (Baş, 2014; Öztürk & Gürbüz, 2014; Tüm and Kunt, 2013; Yıldırım, 2007) and some attempts to eliminate speech anxiety (Atas, 2015; Han & Keskin, 2016; Hamzaoglu, 2015; Koçak, 2010; Yalçın & İnceçay, 2013) have been found to be examined. As it can be understood from these studies, studies on language learning

anxiety in Turkey are generally in the form of learning English as a second language (Sevim (2019: 255) or learning Turkish according to the situation of foreigners learning the second language in Turkish. Our study differs from previous studies in this respect. It is within the scope of second language anxiety of students whose mother tongue is Kurdish and who learn Turkish as a second language in Turkey.

Speaking anxiety is one of the components of language anxiety and perhaps the most prominent in research. According to Demir and Melanlıoğlu (2014: 109), speech anxiety can manifest itself as emotional (sadness, fear, anger) or physical (fast heartbeat, sweating). Several factors increase speech anxiety such as having to demonstrate speaking performance in the lesson or in the exam; fear of wrongdoing, ridicule, and consequent negative evaluation; Grammar, vocabulary, and pronunciation problems and not allowing the use of mother tongue in the foreign language class seem to increase speaking anxiety (Alkan, Bümen and Uslu, 2019).

In addition to the aforementioned speech problems of individuals living in Turkey whose mother tongue is different from Turkish, language proficiency/language level can be shown as an important factor in the formation of this anxiety. The traumatic situations experienced by Kurds in educational institutions, as in many minority communities, are the most obvious examples of this. Coşkun, Derince, and Uçarlar (2010) conducted their research on students whose mother tongue is Kurdish, who did not receive education in their mother tongue due to “communication problems, feeling of being defeated, not being able to finish school or leaving school, stigma, violence, staying silent and waiting for the bell and other”. It has been shown that these children, who have not been able to gain education, have significant speaking anxiety in the second language and this reflects negatively on their education life.

In some other studies carried out on bilingual children (Kaya and Aydın 2013; Sarı, 2001; Sarı, 2002; Tulu 2009; Uçarlar and Derince, 2012; Yiğit, 2009), the problems experienced by students whose mother tongue is different from the language of instruction have been shown to differ according to their grade level. While problems such as not being able to understand what they read or listen to, not being able to express themselves and losing too much time while learning a subject in the first grade, it was stated that these students experienced problems such as lack of communication, marginalization and exposure to various types of violence in the upper grades (Yılmaz & Şekerci, 2016: 49). Likewise, the studies of Kasap (2015), Uğur (2017,) and Açar (2019) show that individuals who do not receive education in their first language mother-tongue see themselves as inadequate in terms of using their language, and they state that especially the dominant second language causes deterioration in the first language and this deterioration and inadequacy have negative effects on language attitudes.

Situations such as word mistakes made by individuals who have not received their mother tongue as the language of instruction and who are educated in a second language, low sentences, hesitations while speaking, trying to say a word or concept in the first language directly translating it into the second language can increase speech anxiety and turn it into a social phobia. Gerlinde et al. (2003: 1373) explained this situation as follows: “Individuals with social phobia experience extreme fear of being negatively evaluated by others when observed or interacting with them. As a result of these feared social situations, these individuals either avoid such situations or have to endure their distress.”

Based on these findings, it can be seen that the speaking anxiety of individuals who do not receive education in the first language in the first years of their education is mostly caused by their second language deficiencies. Because such individuals, for example, are quiet and calm in a second language-educated school environment, but they can be talkative and playful at home or in first language interactive environments.

In the literature, there are bilingualism theories and models for the socio-psychological conditions of those who learn their mother tongue as a first language without receiving an education in

it, and who learn a second language compulsorily due to its status. When we look at the types of bilingualism, studies that are described as an additive and subtractive bilingualism and extending back to Lambert's (1974a, 1974b) studies; In additive bilingualism, individuals' learning a new language does not negate their first language and does not lead to a negative attitude towards the second language ;on the other hand, in subtractive bilingualism, individuals belonging to ethnolinguistic groups with low prestige have shown that their sociocultural values have lost as well as their own language and culture, as they attribute a higher value to the second language (Huguet, Vila & Llorca, 2000; Kasap, 2020). When we look at the example of Kurds in Turkey, it is possible to say that their language situation is an example of subtractive bilingualism. The fact that individuals whose mother tongue or first language is Kurdish and who are exposed to the second language compulsorily in the school environment after acquiring their mother tongue as the first language cannot reach a sufficient academic level in the first language is also reflected in their second language. This is explained by the threshold theory (Cummins, 1976, 1978a; Toukomaa & Skutnabb-Kangas, 1977). Accordingly, there are two types of thresholds, high and low (Cummins, 1976; Toukomaa & Skutnabb-Kangas, 1977). Having a lower bilingual proficiency threshold will be sufficient to avoid any negative cognitive effects, but for accelerated cognitive growth it may be necessary to reach a higher bilingual proficiency level. (Cummins1979:232). In addition, according to Cummins' developmental interdependence hypothesis (1978a, 1979, 1984), second language proficiency depends on the level of development in the first language. As stated by Cummins (1979: 232), many research findings have revealed that the preservation of first language ability will lead to cognitive benefits in the second language of minority language children.

It should be noted here that individuals whose first language is Kurdish may be able to express themselves better at home or in first language interactive environments, but what matters is academic language level and proficiency, which inadequacy in the first language shows itself in the form of failure and anxiety in the second language. Subjects in the field of cognitive psychology regarding the effect of previous learning on subsequent learning can also be explained with Schema Theory in the context of bilingualism. The concept of schema first emerged in 1911, in the work of Head and Holmes in the field of neurology. (Arbib, 1992: 1429) "Schema theory, which is a learning theory first used by Piaget in 1926, sees organized knowledge as a detailed network structure consisting of abstract structures that reveal an individual's perceptions of the world" (Özenici, 2007: 6). Schema Theory can be based on Kant's determination that "concepts can only make sense when they are related to something individuals already know", and the concept of schema was defined by Barlett in 1932 as the repetition of past reactions or constantly working past experiences (Carrell, 1983: 1). In more recent studies, schemas have been called interacting knowledge structures. (Rumelhart and Ortony, 1977 cited by Carrell, 1983: 3).

Based on this, it can be said that the academic proficiency of bilingual individuals in the first language will be reflected in the second language, and an education supported by previous knowledge will contribute positively to the development of children cognitively.

The sample of our study is individuals between the ages of 13-15 whose mother tongue is Kurdish, who cannot receive education in their own language and who learn Turkish as their second language. In this context, our study revealed that the inadequacies of middle school students whose mother tongue is Kurdish are reflected in the second language, and in this sense, it manifests itself in the form of speaking anxiety in the second language, especially at the point of speaking.

## **METHOD**

### **Research Pattern**

This study was designed according to the scanning model, which is one of the research methods. The survey model is research that uses relatively larger samples than other types of research, in which characteristics such as participants' views on a topic or an event, interests, abilities, and

attitudes are revealed. The purpose of these studies is to make a description of the research situation by taking a picture of the current situation (Fraenkel & Wallen & Hyun, 2012).

### Study Group

The study group of the research consists of 368 secondary school students studying in the 8th grade and learning Turkish later in the province of Ağrı, one of the Eastern Anatolian provinces of Turkey, in the 2020-2021 academic year. In this study, the participants were determined according to the homogeneous sampling technique, which is one of the purposive sampling methods and techniques. Purposeful sampling provides the opportunity to conduct in-depth research by selecting information-rich situations according to the purpose of the research (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2009). The reason for choosing the province of Ağrı in the research is that it is a Kurdish-speaking province to a large extent. In addition, since middle school 8<sup>th</sup>-grade students are at an age that is accepted as the age of transition to adolescence, it is thought that individuals at this age have reached the level where they can fully understand what they read (Dey, Newell and Moulds , 2018), and therefore they have been chosen. 58. 2% (n= 214) of the students participating in the study were male and 41.8% (n=154) were female. Descriptive information about the students participating in the research is given in Table 1.

**Table 1.** Descriptive information about the participants of the study

Variable	Category	N	%
Gender	Male	214	58.2
	Girl	154	41.8
Does the mother speak Turkish?	Yes	269	73.1
	No	99	26.9
Does the father speak Turkish?	Yes	360	97.8
	No	8	2.2
Language spoken at home	Turkish	73	19.8
	Kurdish	295	80.2
Your mother and father at home for you what language does he want you to speak?	Turkish	165	44.8
	Kurdish	203	55.2
Total		368	100

### Preparation of data collection tool

The Turkish speaking anxiety scale was conducted to determine the anxiety levels of secondary school students whose mother tongue is not Turkish and who did not receive any education in their mother tongue, and who learned Turkish later. For this purpose, the literature was scanned to create the items to be included in the scale. The prepared item pool consisted of 40 items. It was submitted to the opinion of experts in the field (two assessment and evaluation, classroom education, science education and psychological counseling and guidance, n=5) in order to determine whether the items in the item pool, which was converted into a draft form, would measure the Turkish speaking anxiety of secondary school students appropriately and to determine their linguistic intelligibility. For each item, the experts were asked to mark one of the options "appropriate", "unsuitable, remove" and "correct not appropriate". In line with the suggestions from the field experts, necessary corrections were made and a form consisting of 36 items was created. The prepared form consists of the categories "Never " (1), " Rarely " (2), " Sometimes " (3), " Often " (4), and " Always " (5). Accordingly, the high score obtained from the scale indicates that Turkish speaking anxiety is high.

### Process of preparing data for analysis

The data collected using the data collection tool prepared within the framework of the study were analyzed according to some assumptions suitable for the analysis of the factors. These are: sample size, missing data, normality, linearity, extreme values and structure of R matrix and adequacy of R matrix. First of all, the suitability of the sample size for factor analysis should be examined. There is no consensus among researchers about the sample size for factor analysis (İlhan & Çetin, 2014).

However, in the literature, it is necessary to apply 3-6 times as many participants as the number of items in the scale for factor analysis, it is argued that 200 participants are suitable for factor analysis, and it is very good if 500 participants are applied (Cattell, 1978). The structure of the factor becomes more evident as the number of participants increases, but this is accepted when it reaches 5 times the total number of items (Stevens, 2002; Gorsuch, 1983). 368 students participated in this study and when the data were compared with the data collected from the students, no missing data was found. To test the normality and linearity of the data set, it was checked whether the total scores were evenly distributed. Skewness and kurtosis coefficients were examined by performing normality tests. The z-scores of each variable were checked to determine whether there were outliers in the data set. It was observed that the z-scores of the variables were in the range of  $\pm 3.00$ . By calculating Mahalanobis distances, it was checked whether all variables were outliers in multiple variables. All variables were examined and it was concluded that there were no extreme values in the data set. In order to control the factorability of R, the KMO (Kaiser-Meyer-Olkin) value and Bartlett's Test results were examined. The KMO value was found to be .84, and the result of the Bartlett test ( $\chi^2=1631.837$ ,  $p<0.01$ ), which tests multivariate normality, was also significant. Considering this result, it can be said that the data are suitable for factor analysis.

### **Analysis of Data**

In the research, it was tried to ensure content validity by interviewing 5 different experts from the field. In this way, content validity rates and indices were calculated. Then, statistical analyzes were made so as to determine the characteristics of the measurements by applying TSAS to the participant group. By using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), the construct validity of the scale was examined and the factor structure of the scale was revealed. While applying EFA and CFA in the test development process, different versions are applied, but when the sample size is sufficient, it is recommended to apply EFA with half of the data and CFA with the other half, and this approach is frequently used in the test development process (Henson & Roberts, 2006). Since the sample size was sufficient in this study, it was decided to apply EFA with the data of 168 participants and CFA with the remaining part. In this study, the 36-item scale was applied to 368 participants. While performing exploratory factor analysis, correlation values between dimensions were examined by using the direct oblimin rotation technique and it was seen that there was a low correlation between dimensions. As a result, it was decided that the sub-dimensions of the scale were independent of each other. When performing factor analysis, it is recommended to use the varimax method for sub-dimensions that are independent and when the relationship between sub-dimensions is low (Tabachnick & Fidell, 2007). One of the advantages of the maximum probability factor analysis estimation method is that it provides an opportunity for statistical evaluations on how better factor analyzes can be made in order to rearrange the relations between the indicators in the data set (Cokluk, Şekercioğlu, & Büyüköztürk, 2016). For this reason, "principal components analysis" was used as the factorization method and the "varimax" method, which is one of the vertical rotation methods, was used as the factor rotation method while performing EFA. The reliability of the scale was tried to be ensured by calculating the Cronbach Alpha internal consistency coefficient and item-total correlations for the whole scale and each of its sub-dimensions. However, within the scope of the scale's criterion validity, the difference between the scores of the 27% upper group and 27% subgroup from the total scale was analyzed with the t-test for independent groups. In order to test the validity in another way, it was examined whether the total scores of the participants whose distribution was homogeneous between the classes differed according to their gender, whether the mother knew Turkish, whether the father knew Turkish or not, and the language that the parents wanted to be spoken at home. In order to determine the appropriate test, the normality of the distribution was checked first. It was concluded that the total score of the scale showed a normal distribution for all variables ( $p>.05$ ). Therefore, the significance of the difference between the total scores of the participants according to the mentioned variables was tested by using ANOVA, one of the parametric methods used for unrelated measurements. In addition, the data collection tool was collected in writing and the analysis of the data; It was made with the help of the SPSS 25 package program and LISREL 8.7 program.



## RESULTS

In this section, validity and reliability information about “Turkish speaking anxiety scale” is given.

### Scope Validity

For all the items of the Turkish speaking anxiety scale, the opinions of 5 different field experts were taken, CVR's were calculated based on these opinions and the form was created. When half of the experts on the item give an opinion of "Suitable", it will be  $CVR=0$ , when more than half of the experts give an opinion of "Suitable",  $CVR>0$ , and when less than half of the experts give an opinion of "Suitable", it will be  $CVR<0$ . It is argued that the content validity criterion should be at least 0.99 for 5 field experts (Veneziano & Hooper, 1997). The content validity index (CGI) is obtained over the total CVR averages of the items that are significant at the  $\alpha = .05$  level and that will be included in the final form (Yurdugül, 2005). In line with the opinions of the experts, it was seen that 8 items out of 40 were insufficient to measure the Turkish speaking anxiety of secondary school students. According to the opinions of the experts, 4 of the 8 items were changed based on the content validity rates; 4 of them are out of form. After these items expressed in this context were removed from the test, the CGI was recalculated and the calculated value was found to be sufficient.

After the arrangement, an intelligibility study was conducted with a small group to test the intelligibility of the Turkish speaking anxiety scale. Thus, the level of agreement of the items on the scale of the students who responded to the scale and the opinions of the students for each item were taken. Finally, before the scale was applied, it was reproduced in written form and applied face to face to the students on a voluntary basis. The pre-application of the scale was completed with the collected data. After the preliminary application study was completed, the pilot application was started.

### Construct validity

EFA and CFA were conducted to determine the construct validity of the Turkish speaking anxiety scale (TCLS).

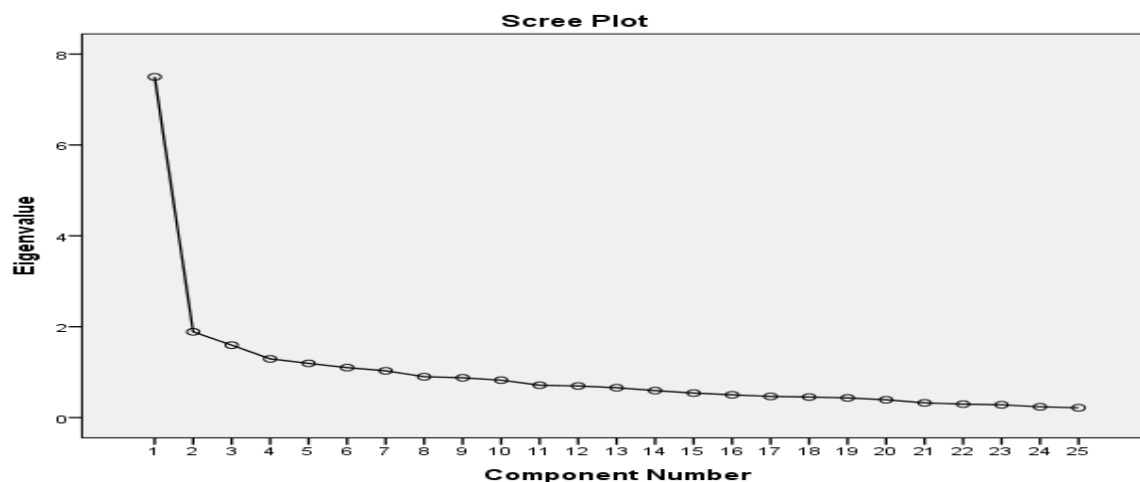
### Exploratory Factor Analysis (EFA)

Exploratory factor analysis was performed to determine the item factor loads of the items in the Turkish speaking anxiety scale and to determine the construct validity of the scale. Before starting the exploratory factor analysis, the data were calculated with the Kaiser-Meyer-Olkin (KMO) coefficient and the Barlett Sphericity test to evaluate their suitability.

As a result of the exploratory factor analysis, it was seen that the items with an eigenvalue greater than 1 were collected in 10 factors. It is seen that the items collected in 10 factors explain 64,420% of the scale. In the literature, it is suggested that factor loads should be above 0.30 in EFA analysis findings (Floyd & Widaman, 1995; Tabachnick & Fidell, 2007). Accordingly, items with a factor load of 0.30 and below were excluded from the analysis. Accordingly, 7 items with a factor load of .30 or less were excluded from the analysis. As a result of EFA, it was seen that 3 items were overlapped. Also, item 5 was not included in the analysis because the item-total correlation was less than 0.30. In EFA analysis, items having between 0.20-0.30 values can be included in the analysis when necessary, however values less than 0.20 should not be included in the analysis (Büyüköztürk, 2017). Considering the purpose of the study and the results of the EFA, it was decided to collect the items in three factors. The characteristics of the items related to repeated EFA results are presented in Table 2. The eigenvalues obtained as a result of the EFA analysis and the percentages of total variance explained are given in Table 2 and the scree line graph result is shown in Figure 1.

**Table 2.** Explanatory Factor Analysis and Disclosed Eigenvalue Results

	EFA eigenvalue results	Total variance explained
Dimension I	7,498	18,519
Dimension II	1.888	15.071
Dimension III	1.594	10.333



**Figure 1.** Line Chart

When Table 2 was examined, it was concluded that the items were collected in three factors as a result of the EFA analysis. The first factor of the scale explained 18,519 of the total variance, the second dimension explained 15.071% of the total variance, and the third dimension explained 10.333% of the total variance. It is seen that the three-factor items obtained from the scale as a result of EFA explained 43,923% of the total variance.

**Table 3.** Factors and factor loads resulting from EFA

Factor 1 (Anxiety) Cronbach Alpha=0.904 Variance Explained= 18.519%			
	Factor Load		
	one	2nd	3
21. I get nervous when speaking Turkish in class.	.606		
26. I worry when the teacher asks questions in class.	.567		
27. I am afraid of making mistakes when speaking Turkish.	.623		
30. I am not willing to participate in class activities or discussions because I do not speak Turkish well.	.654		
31. Some Turkish words I know do not come to mind when speaking in class.	.634		
32. I get nervous when speaking in front of a native Turkish speaker.	.746		
33. When speaking Turkish, I feel I fall behind of my friends.	.613		
34. I am very afraid that the teacher will ask me questions in the lesson because I do not express myself well in Turkish.	.593		
35. I hesitate to ask my teacher questions because my Turkish is not good.	.700		
36. When I explain a subject in class, I think that my teacher and fellow students will not be able to understand me well.	.579		
Factor 2 ( reluctance ) Cronbach Alpha=0.829 Explained variance=15.071 %			
	Factor Load		
	one	2nd	3
4. I do not want to talk about a subject in Turkish in front of the class.		.523	
5. I do not understand some Turkish words my teacher uses.		.625	
6. I don't want to come forward to explain something.		.576	
7. Some words my teacher uses are unfamiliar to me.		.667	
8. When speaking Turkish, I often pause to use the appropriate word.		.561	
9. I often pause between words while speaking.		.545	
10. I find it difficult to form long sentences.		.531	
12. I am reluctant to participate in classroom drama activities due to my lack of Turkish.		.640	
13. Because my Turkish is not good, I prefer to remain silent in class.		.538	

Factor 3 (insufficiency) Cronbach Alpha=0.733 Explained variance=10.333%			
	Factor Load		
	one	2nd	3
1. I can't speak Turkish fluently.			.698
2. I think my Turkish speaking level is not good.			.551
11. I do not feel sufficient speaking Turkish in front of the 11th class.			.581
16. When speaking Turkish, I would like to ask short questions and give short answers.			.375
18. I think that there are problems with my Turkish accent due to the influence of my mother tongue.			.519
23. When speaking, I think first in my mother tongue and then translate it into Turkish.			.589
TOTAL VARIANCE ANNOUNCED %			43,923%

As a result of factor analysis, it was decided that the scale should have a three-factor structure. Table 3 shows the items and factor loads. The first factor was named “Anxiety”, the second factor “reluctance” and the third factor “insufficiency”, considering the content and theoretical structures of the items revealed as a result of the EFA analysis. The first factor explains 18,519 % of the total variance and consists of 10 items. The factor loads of the items that make up this sub-dimension range from 0.567 to 0.746. The second factor explains 15,071 % of the total variance and consists of 9 items. The factor loads of the items that make up this sub-dimension range from 0.523 to 0.667. The third factor explains 10,333 % of the total variance and consists of 6 items. Factor loadings of the items constituting this sub-dimension ranged from 0.375 to 0.698. In this study, items with factor loading values of 0.30 and above were evaluated (Büyüköztürk, 2010).

When these three factors are evaluated together, it is seen that the items on the scale explain 43,923% of the total variance. It was observed that there was a low correlation between the correlation coefficients between the sub-dimensions of the scale. As a result of the correlation between dimensions, the correlation between the first and second sub-dimensions was calculated as 0.299. The correlation between the first and the third sub-dimension was calculated as 0.267. The correlation between the second and the third sub-dimension factor was calculated as 0.264. According to these findings, it was concluded that the sub-dimensions were independent of each other. Therefore, in the factor analysis study, it was seen that the application of vertical rotation was appropriate. Therefore, Varimax, one of the vertical rotation methods, was applied. The correlation coefficients between the scale sub-dimensions are presented in Table 4.

**Table 4.**Correlation Coefficients Between Factors

Factors	Anxiety	Reluctance	Insufficiency
<b>Anxiety</b>	1.00	0.299	0.267
<b>Reluctance</b>		1.00	0.264
<b>Insufficiency</b>			1.00

### Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was applied to test the accuracy of the structure consisting of 25 items and three sub-dimensions obtained as a result of exploratory factor analysis. The fit index values for TSAS are given in Table 4 The chi-square, chi-square/degree of freedom, and goodness-of-fit indices calculated when this construct was tested are presented in Table 5. In addition, the table includes the evaluation criteria accepted for indexes according to Schermelleh-Engel, Moosbrugger, and Müller (2003).

**Table 5.** DFA Results of the Three-Dimensional Implicit Structure Established with CFA

Model	$\chi^2$	$\chi^2/sd$	NNFI	NFI	CFI	RMSEA
Three-Factor Structure	541.87	2.01	0.95	0.91	0.95	0.07
Criteria		3.0	$\geq 0.95$	$\geq 0.95$	$\geq 0.95$	$\leq 0.08$

When Table 5 is examined, it is seen that the CFA model fit values of the three-factor structure are in the appropriate range.

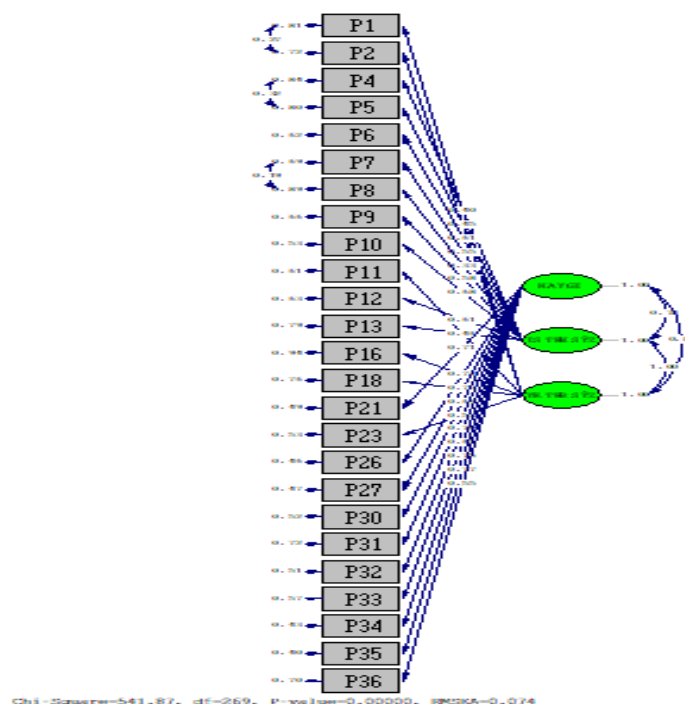
**Table 6.** T-test Values Obtained from CFA for TKSS

Item No.	t	Item No.	t	Item No.	t
ANXIETY1	10.93*	ANXIETY10	7.82*	RELUCTANCE9	6.19*
ANXIETY2	11.42*	RELUCTANCE1	5.39*	INSUFFICIENCY1	6.06*
ANXIETY3	11.19*	RELUCTANCE 2	6.03*	INSUFFICIENCY2	7.38*
ANXIETY4	10.47*	RELUCTANCE 3	8.72*	INSUFFICIENCY3	9.03*
ANXIETY5	7.57*	RELUCTANCE 4	7.71*	INSUFFICIENCY4	3.16*
ANXIETY6	10.68*	RELUCTANCE 5	4.25*	INSUFFICIENCY5	6.86*
ANXIETY7	9.73*	RELUCTANCE 6	8.14*	INSUFFICIENCY6	10.08*
ANXIETY8	11.79*	RELUCTANCE7	9.99*		
ANXIETY9	12.24*	RELUCTANCE8	8.69*		

\*p<.01

When Table 6 is examined, the t-test values of the first dimension are between 7.57 and 12.24, between 4.25 and 9.99 for the second dimension, and between 3.16 and 10.08 for the third dimension. It can be seen that values between if the t value found is greater than 2.58, it is significant at the .01 level, and if it is greater than 1.96, it is significant at the .05 level (Jöreskog & Sörbom, 2000; Kline, 2011). The t-test values obtained as a result of CFA were found to be significant at the .01 level for all items of the scale. Byrne (2010), if the t value is not significant; either it is considered that the number of participants is low or it is commented that items should be removed from the model. Since the t value of the scale items was significant, it was thought that the number of participants in the study was sufficient. Therefore, it was understood that no item needed to be removed from the model.

It was seen that the three-dimensional structure that emerged as a result of the EFA analysis was confirmed as a result of the CFA analysis. It was seen that the structure created by considering the literature research was statistically confirmed. The model created as a result of DFA is given in figure 2.



**Figure 2.** Measurement Model of TSAS

## Reliability

In this study, since it was seen that the factor loads of the items were not equal (congeneric measurement) and the scale was not unidimensional, McDonalds reliability coefficient was calculated for the sub-dimensions of the scale and the whole scale (Lucke, 2005), and this coefficient was obtained by DFA. The McDonald's coefficient (known as "congeneric reliability") of the subscale dimensions in the Turkish speaking anxiety scale were respectively .90, .82 and .73, and the McDonald's  $\omega$  coefficient for all items of the scale was .92. Considering McDonald's  $\omega$  obtained in the scale, it can be concluded that the reliability coefficient is high. According to these findings, it was concluded that the scale is a reliable measurement tool.

## Item analysis

The corrected total correlation was calculated to determine the predictive power of the total score and to determine the item discrimination. In addition, 27% lower-upper groups were compared.

**Table 7. TSAS Item Analysis Results**

Item No. new	Old	When Item Is Removed scale alpha	Corrected Item Total Correlation	Average	Standard deviation	Skewness
ANXIETY1	21	.923	.644	1.85	1.22	1.30
ANXIETY2	26	.923	.649	2.10	1.29	.98
ANXIETY3	27	.923	.649	2.01	1.28	1.06
ANXIETY4	30	.924	.614	1.94	1.28	1.16
ANXIETY5	31	.924	.594	2.14	1.25	.82
ANXIETY6	32	.924	.620	1.84	1.20	1.34
ANXIETY7	33	.924	.589	1.73	1.23	1.59
ANXIETY8	34	.923	.665	1.76	1.21	1.48
ANXIETY9	35	.922	.698	1.80	1.23	1.41
ANXIETY10	36	.925	.524	2.09	1.34	.971
RELUCTANCE1	4	.926	.474	2.18	1.47	.89
RELUCTANCE2	5	.926	.475	2.19	1.22	.78
RELUCTANCE3	6	.925	.543	2.04	1.36	1.04
RELUCTANCE4	7	.925	.540	2.14	1.22	.82
RELUCTANCE5	8	.927	.426	2.33	1.34	.74
RELUCTANCE6	9	.925	.562	2.05	1.19	.99
RELUCTANCE7	10	.923	.647	1.93	1.21	1.13
RELUCTANCE8	12	.924	.608	1.89	1.24	1.17
RELUCTANCE9	13	.925	.533	1.97	1.35	1.07
INSUFFICIENCY1	one	.928	.398	2.37	1.53	.66
INSUFFICIENCY2	2nd	.924	.574	1.91	1.33	1.29
INSUFFICIENCY3	11th	.923	.645	2.01	1.41	1.13
INSUFFICIENCY4	16	.929	.328	2.70	1.51	.33
INSUFFICIENCY5	18	.925	.517	2.04	1.27	1.00
INSUFFICIENCY6	23	.924	.609	2.07	1.13	1.00

\*p<.005

Data in Table 7 are examined, the 27% item-total correlation results of the lower and upper groups range from .524 to .698 in the first factor, between .426 and .647 in the second factor, and between .328 and .609 in the third factor. It is accepted that a total item correlation of .30 and above is sufficient for the interpretation of the items used to distinguish the features to be measured (Büyüköztürk, 2010; Erkuş, 2012). All items of the scale meet this value. Therefore, according to the results of the item analysis, it can be said that all of the items in the scale are distinctive.

The independent sample t-test" was employed to provide the additional evidence of construct validity of the scores of the 27% lower and upper groups of the participants and to determine the difference between their total scores.

For this purpose, 27% of the data obtained from 524 prospective teachers was divided into two groups as lower and upper groups. The t test results according to the group statistics of each item and the scores of each group from the scale are given in Table 8.

**Table 8.** Item Analysis Results Based on 27% Sub-High Groups of TSAS

Matter	group	$\bar{X}$	t	p	Matter	group	$\bar{X}$	t	p
one	Upper	3.03			18	Upper	2.92		
	Lower	1.48	8.49	.00		Lower	1.33	10.48	.00
2nd	Upper	2.84			21	Upper	2.88		
	Lower	1.07	11.76	.00		Lower	1.13	12.31	.00
4	Upper	2.97			23	Upper	3.35		
	Lower	1.28	9.95	.00		Lower	1.32	12.66	.00
5	Upper	2.86			26	Upper	3.21		
	Lower	1.53	8.86	.00		Lower	1.25	14.09	.00
6	Upper	2.94			27	Upper	3.12		
	Lower	1.17	11.93	.00		Lower	1.19	13.86	.00
7	Upper	3.02			30	Upper	2.99		
	Lower	1.41	11.26	.00		Lower	1.07	14.42	.00
8	Upper	2.98			31	Upper	3.08		
	Lower	1.58	8.76	.00		Lower	1.37	12.32	.00
9	Upper	2.93			32	Upper	2.80		
	Lower	1.29	12.19	.00		Lower	1.05	13.90	.00
10	Upper	3.00			33	Upper	2.70		
	Lower	1.15	13.47	.00		Lower	1.04	11.77	.00
11th	Upper	3.24			34	Upper	2.89		
	Lower	1.04	15.32	.00		Lower	1.00	14.43	.00
12	Upper	2.89			35	Upper	2.96		
	Lower	1.08	13.30	.00		Lower	1.04	14.58	.00
13	Upper	3.01			36	Upper	3.02		
	Lower	1.19	12.08	.00		Lower	1.26	11.93	.00
16	Upper	3.39							
	Lower	1.85	8.55	.00					

When Table 8 is examined, it is seen that there is a significant difference between the scores obtained from the lower and upper groups ( $p < .05$ ). In addition, it is seen that the arithmetic averages of the students in the upper group are higher than the arithmetic averages of the students in the lower group. In addition, it is seen that there is a significant difference between the upper group and the lower group. Therefore, it was concluded that the items were distinctive.

Additionally, in order to determine construct validity of the scale, the scale was applied to 8<sup>th</sup>-grade students studying in different schools. Table 9 shows the results of one-factor analysis of variance (One-Way ANOVA) in an unrelated sample to determine whether the items differ according to the students' gender, whether the mother speaks Turkish, whether the father speaks Turkish, the language spoken at home, and the language that the parents want to be spoken at home.

**Table 9.** ANOVA results of the total scores of 8<sup>th</sup>-grade students in TSAS according to the gender of the students, whether the parents know Turkish or not, the language spoken at home and the language the family wants to be spoken at home.

Variables	Groups	N	$\bar{X}$	ss	F	p	$\eta^2$
Gender	Boy	216	53.00	18.57	14.73	.000	.03
	Girl	152	45.96	15.36			
Does the mother speak Turkish?	Yes	269	48.46	17.29	8.72	.003	.02
	No	99	54.52	17.90			
Does Dad Speak Turkish?	Yes	360	50.08	17.62	.007	.931	
	No	8	50.62	19.79			
What Language Does Your Family Want You To Speak With You At Home?	Turkish	165	47.81	17.62	5.051	.02	.01
	Kurdish	203	51.94	17.48			

When Table 9 is examined, it is seen that there is a significant difference between the 8<sup>th</sup>-grade students' speaking anxiety and their gender,  $F(1, 367) = 14.73, p < .05$ . That is, male students ( $\bar{X} = 53$ ) have more Turkish speaking anxiety than female students ( $\bar{X} = 45.96$ ). It is seen that there is a significant difference between the Turkish speaking anxiety of 8<sup>th</sup>-grade students and their mothers' level of knowing Turkish,  $F(1, 367) = 8.72, p < .05$ . That is, those whose mothers do not speak Turkish ( $\bar{X} = 54.52$ ) seem to have higher Turkish speaking anxiety than those whose mothers speak Turkish ( $\bar{X} = 48.46$ ). It is seen that there is no significant difference between the Turkish speaking anxiety of 8<sup>th</sup>-grade students and their fathers' Turkish proficiency,  $F(1, 367) = .007, p > .05$ . That is, the anxiety of speaking Turkish of those whose fathers do not speak Turkish ( $\bar{X} = 50.62$ ) does not seem to differ significantly from those whose fathers speak Turkish ( $\bar{X} = 50.08$ ). It is seen that there is no significant difference in Turkish speaking anxiety among those whose fathers do not speak Turkish ( $\bar{X} = 50.62$ ) than those whose fathers speak Turkish ( $\bar{X} = 50.08$ ). It is seen that there is a significant difference between the Turkish speaking anxiety of 8<sup>th</sup>-grade students and the language that parents want their children to be spoken at home,  $F(1, 367) = 5.051, p < .05$ . That is, students whose parents want their children to speak Kurdish as a language at home ( $\bar{X} = 51.94$ ) have higher Turkish speaking anxiety than students whose parents want their children to speak Turkish ( $\bar{X} = 47.81$ ).

It is recommended to use the eta-square ( $\eta^2$ ) correlation coefficient to determine the effect size (Büyüköztürk, 2017). The effect size takes a value between 0.00 and 1.00. It is interpreted as a small effect between 0.01 and 0.06, a medium effect between 0.06 and 0.14, and a large effect 0.14 and upper (Büyüköztürk, 2017; Cohen, 1988). In this study, the effect size between 8<sup>th</sup>-grade students' Turkish speaking anxiety and their gender was found to be .03, the effect size of their mothers to know Turkish was .02, and the effect size of the language they wanted to be spoken at home was .01. In this case, it can be said that the effect size obtained in this study has a small effect.

## CONCLUSION AND DISCUSSION

Language anxiety in general and speaking anxiety in particular is a phenomenon that can affect the education life of individuals who try to learn a second language after acquiring the first language. This subject has been studied in the literature in the world and in Turkey mostly as foreign language learning anxiety and its components, speaking, listening, reading or writing anxiety. On the other hand, this study is a scale development study developed to measure the second language speaking anxiety of individuals who acquire their mother tongue (Kurdish) and learn their second language (Turkish) in the school environment since it is the official language. In this respect, our study will be one of the first studies in this category in Turkey. It aims to develop a measurement tool in order to obtain valid and reliable measurements of Turkish speaking anxiety of 8<sup>th</sup>-grade secondary school students whose mother tongue is Kurdish and who learned Turkish later. While developing TSAS, a pool of 40 items was created. In order to ensure the content and face validity of the scale, four expert opinions were obtained. The created item pool was turned into a draft consisting of 40 items. Items in the scale; It was applied to 8<sup>th</sup>-grade students with a five-point Likert-type rating of Always (5) → Never (1). CFA and EFA analyzes were used to determine the construct validity of TSAS. According to the result obtained in the EFA analysis, it was seen that the items had a three-factor structure. The scale consisted of 25 items and it was seen that these items explained 43,923% of the total variance. Considering the content and theoretical structures of the items obtained as a result of EFA, the first factor was named Anxiety, the second factor was Reluctance and the third factor was Inadequacy. DFA was used to test the three-dimensional structure obtained as a result of the EFA analysis. As a result of CFA, it was seen that the fit indices of the three-dimensional structure of TSAS were appropriate. Values of 35% or more of the variance rate explained in the EFA was taken as a criterion. It is understood that the CFA fit indices for values of 0.35 and above are appropriate. For these reasons, it was concluded that TSAS provided construct validity according to the results of EFA and CFA. According to the result obtained from the TSAS, the internal consistency reliability of the result of the scale was tested with the method (Cronbach's Alpha reliability coefficient), and the item-total correlations were examined. For the criterion validity of the data obtained from the scale, the difference between the total scale scores of the 27% upper-lower groups was analyzed using the independent sample t-test.

McDonald's  $\omega$  coefficient reliability of the measurements was calculated as .90 in the Anxiety to the student, .82 in reluctance, 0.73 in the insufficiency, and .92 for the whole scale. Liu (2003) points out that the internal consistency coefficients are .70 and above as evidence that the scale can be qualified as reliable.

For the reliability of the measurements, it is accepted that the reliability coefficient is .70 and above (Fornell & Larcker, 1981; Tezbaşaran, 1997; Nunnally & Bernstein, 1994).

Item analysis was performed to reveal the predictive power of the total score of the items obtained from the TSAS and to determine the item discrimination levels. While performing the item analysis, the 27% lower and upper groups were compared and the corrected item-total correlation was examined. As a result of the item analysis, the corrected item-total correlation results were found to be between .524 and .665 in the Anxiety sub-dimension, between .426 and .647 in the second factor, the Reluctance sub-dimension, and between .398 and .645 in the third factor, Inadequacy sub-dimension. In addition, the t-value for the differences between the 27% upper group and the 27% lower group of the scores obtained from the scale was found to be significant for all items on the scale. According to these results, it was concluded that all the items of the TSAS were distinctive. According to the findings obtained in the research, it was revealed that TSAS would make valid and reliable measurements in determining the Turkish speaking anxiety of secondary school students.

In the light of the data obtained from the variables of the scale we developed; There is a significant difference between 8th grade students' Turkish speaking anxiety and their gender, that is, male students' Turkish speaking anxiety is higher than female students, and there is a statistically significant difference between students' Turkish speaking anxiety and their mothers' level of knowing Turkish. Likewise, it was concluded that there was a significant difference between the Turkish speaking anxiety of these students and the language that the parents wanted their children to speak at home, that is, the students whose parents wanted their children to speak Kurdish at home had a higher Turkish speaking anxiety than the students who wanted their children to speak Turkish. Whereas, there is no significant difference between the Turkish speaking anxiety of these students and their fathers' Turkish proficiency;

Among the variables of our study, gender, mothers' Turkish proficiency, fathers' Turkish proficiency, and the language that parents want their children to be spoken at home, which we could find in the literature, on similar variables -mostly those related to foreigners' Turkish learning anxiety- were examined; It is seen that there are different results regarding the effect of gender variable on anxiety. According to Sevim (2019), there are studies where there is no significant difference in gender level, as well as studies (Aktaş, 2018; Boylu & Çangal, 2015; Erdil, 2016; Özdemir, 2013; Sevim, 2014; Tunçel, 2014; Yılmaz, 2018). ), which determined that female students are more anxious than male students (Karçiç & Çetin, 2015). In addition, in the study of Polatcan, Alyılmaz, and Er (2019), in the scale adaptation study of Melanlıoğlu and Demir (2013) for the speaking anxiety of foreigners learning Turkish, speaking anxiety is not related to the personal characteristics of individuals and it is seen as a situation in the skill dimension; In the studies conducted by Erdil (2016) and Halat (2015), it was understood that there was no significant relationship between students' gender, age, and the number of foreign languages they knew.

Based on these results; We suggest that the scale developed by our study to measure the second language speaking anxiety of Kurdish-Turkish bilingual students can be applied in many settlements in Turkey with similar conditions, and can also be applied to foreign students who have settled in Turkey through immigration or asylum in recent years and are educated in schools in Turkey.

**Conflicts of Interest:** There is no conflict of interest between the authors.

**Funding Details:** This work was not funded by any organization.



**CRedit Author Statement:** The authors declare that they have no competing interests.

**Ethical Statement:** The data of this research started to be collected in December 2019, but were collected in 2020. At that time, the decision of the ethics committee to collect data was not mandatory in Turkey. therefore, there is no ethical committee decision.

## REFERENCES

- Açar, Z. (2019). *Tesîra Helwestê li ser Tercîha Ziman di Jiyana Kurdîzanan de -Nimûneya Wanê*. Teza Doktorayê, Beşa Ziman û Edebiyata Kurdî, Bingöl.
- Alkan, H., Bümen, N., ve Uslu, N. (2019). İngilizce konuşma kaygısı ölçeği'nin Türkçeye uyarlanma çalışması. *Gazi Üniversitesi Eğitim Fakültesi Dergisi*. 39(2), 1157-1180.
- Arbib, M. A. (1992). Schema theory. *The encyclopedia of artificial intelligence*, 2, 1427-1443.
- Büyüköztürk, Ş. (2017). Sosyal bilimler için veri analizi el kitabı. Ankara: Pegem Akademi Yayınları.
- Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö.E., Karadeniz, Ş., & Demirel, F. (2012). *Bilimsel Araştırma Yöntemleri*. Pegem Akademi Yayıncılık, Ankara.
- Bekleyen, D. N. (2004). Foreign Language Anxiety. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 13 (2), 27-39.
- Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications and programming*. New York, NY: Taylor and Francis Group.
- Carrell, P. L. (1983). Schema Theory and Language Comprehension, University of Hawaii at Manoa. Department of English as a Second Language.
- Cohen J.(1988). *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed. Hillsdale, New Jersey: Erlbaum.
- Coşkun, V., Derince M. Ş., & Uçarlar, N. (2010). *Kula Ziman*, wer: Elîxan Loran û Ergin Öpengin, weş: DÎSA, Amed.
- Cummins, J. (1979). Linguistic Interdependence and the Educational Development of Bilingual Children. *Review of Educational Research*. 49 (2), 222-251.
- Çokluk,Ö., Şekercioğlu, G., & Büyüköztürk, Ş.(2016).Sosyal bilimler için çok değişkenli istatistik: SPSS ve LISREL uygulamaları(Multivariate statistics for social sciences: SPSS and LISREL applications).Ankara: Pegem Akademi Yayınları.
- Demir, T., & Melanlıoğlu D. (2014). Ortaokul Öğrencileri İçin Konuşma Kaygısı Ölçeği: Geçerlik ve Güvenirlik Çalışması, *Journal of Faculty of Educational Sciences*, 47 (1), 103-104.
- Dey, S., Newell, B. R., & Moulds, M. L.(2018). The relative effects of abstract versus concrete thinking on decision-making in depression. *Behaviour Research and Therapy*, 110, 11-21.
- Erkuş, A. (2012). *Psikolojide ölçme ve ölçek geliştirme*. Ankara: Pegem Akademi Yayınları.
- Fornell, C., & Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.

- Gerlinde, C. H., & Richard G. H. (2003). Behavioral assessment of public-speaking anxiety using a modified version of the social performance rating scale. *Behaviour Research and Therapy* 41 (2003) 1373–1380.
- Gorsuch, R. L. (1983). Factor analysis (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Henson, R., K. & Roberts, J., K. (2006). Use of exploratory factor analysis in published research: Common errors and some comment on improved practice. *Educational and Psychological Measurement*, 66(3), 393-416.
- Huguet A., Vila I. & Llorca E. (2000). Minority Language Education in Unbalanced Bilingual Situations: A Case for the Linguistic Interdependence Hypothesis. *Journal of Psycholinguistic Research*, 29 (3), 313-333.
- Kasap, S. (2015). *The Role of Attitude in the First Language Attrition Among Kurdish Bilingual Adolescents in Turkey*, Doktora Tezi, Aydın Üniversitesi Sosyal Bilimler Enstitüsü, Aydın.
- Kasap, S. (2020). *Attitude and First Language Attrition*, Anı Yayıncılık, Ankara.
- Liu, Y. (2003). Developing a scale to measure the interactivity of websites. *Journal of advertising research*, 43(2), 207–216.
- Lucke, J. F. (2005). The  $\alpha$  and  $\omega$  of congeneric test theory: An extension of reliability and internal consistency to heterogeneous tests. *Applied Psychological Measurements*. 29(1), 65-81.
- İlhan, M., & Çetin, B. (2014). Sınıf değerlendirme atmosferi ölçeğinin (SDAÖ) geliştirilmesi: Geçerlik ve güvenirlik çalışması. *Eğitim ve Bilim*, 39(176), 31-50.
- İlhan, M., Çetin, B., & Bars, M. (2013). Katılımcı Değerlendirmeye Yönelik İnanç Ölçeği'nin (KDYİÖ) Türkçe Uyarlaması: Geçerlik ve Güvenirlik Çalışması. *Journal of European Education*, 3(2), 17-35
- Jöreskog, K., & Sörbom, D. (2000). LISREL [Computer Software]. Lincolnwood, IL: Scientific Software, Inc.
- Özenici, S. (2007). *Şema Teorisinin Öğrenci Erişisine Okuduğunu Anlama Düzeyine ve Bilginin Kalıcılığına Etikisi*, Doktora Tezi, Selçuk Üniversitesi Eğitim Bilimleri Anabilim Dalı, Konya.
- Özusta, H. Ş. (1995). Çocuklar İçin Durumluk-Sürekli Kaygı Envanteri Uyarlama Geçerlik ve Güvenirlik Çalışması, *Türk Psikoloji Dergisi*. 10 (34), 32-44.
- Polatcan, F., Alyılmaz, S. & Er, O. (2019). İkinci Dil Olarak Türkçe Öğrenme Kaygısı Ölçeğinin Geliştirilmesi: Geçerlik ve Güvenirlik Çalışması. *OPUS International Journal of Society Researches*, 11 (18), 384-401 .
- Pichette, F. (2009). Second Language Anxiety and Distance Language Learning *Foreign Language Annals*. 42 (1), 77-93.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Test of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research-Online*, 8(2), 23-74.

- Sevim, O. (2019). Yabancı dil olarak Türkçe öğrenmeye yönelik motivasyon: Bir ölçek geliştirme çalışması. *Türkiyat Araştırmaları Enstitüsü Dergisi*, (65), 567-586.
- Stevens, J. (2002). *Applied Multivariate Statistics for the Social Sciences* (4th Edition). Mahwah, NJ: Lawrence Erlbaum Associates.
- Tabachnick, B. G., & Fidell, L.S. (2007). *Using multivariate statistics* (5th ed.). New York: Allyn and Bacon.
- Tetik Küçükkelçi, D. (2019). Hastane anksiyete ve depresyon ölçeği (HADS) ÜZERİNE BİR çalışma. *Yaşam Becerileri Psikoloji Dergisi*, 3(5), 85-91
- Uğur, N. (2017). *Anadili Eğitim Dilinden Farklı Olan Öğrenci ve Velilerin Yaşadıkları Sorunların Çözümlemesi (Diyarbakır İli Örneği)*. Doktora Tezi. Ankara Üniversitesi Eğitim Bilimleri Enstitüsü. Ankara.
- Yılmaz, F., & Şekerci, H. (2016). Ana dil sorunsalı: Sınıf öğretmenlerinin deneyimlerine göre ilkokul öğrencilerinin yaşadıkları sorunlar. *Eğitimde Nitel Araştırmalar Dergisi - Journal of Qualitative Research in Education*, 4(1), 47-63,
- Zheng, Y. (2008). Anxiety and Second/Foreign Language Learning Revisited, *Canadian Journal for New Scholars in Education*. 1 (1), 1-12.

