International Journal of Progressive Education

**Frequency:** Six times a year.

**ISSN:** 1554-5210

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

**Indexing/Abstracting:**

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

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

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Using Game-Based Learning in Place Value Teaching in Primary School: A Mixed-Method Study

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Abstract

This article seeks to determine how game-based mathematics teaching affects students’ success when compared with conventional instruction for the place value concept in primary school. The study was carried out with a convergent/parallel mixed-method research design. The study group consisted of 51 second-grade primary school students and their teacher. All research data were collected over a period of four weeks. In the quantitative part of the research, a quasi-experimental design with pretest and posttest control groups was carried out. Quantitative data were obtained with an achievement test specifically prepared for the research. All quantitative data were statistically analyzed using t-test. The qualitative part of the data involved audio and video recordings of students’ interactions, teacher’s diaries, and semi-structured interview forms collected from 26 second-grade primary school students in the experimental group. Quantitative data were analyzed using content analysis. The results showed that the game-based learning method was more effective than the conventional method. Students better understood the place value concept with gamification. Moreover, they increased their interest and motivation toward mathematics courses. Despite all these findings and the fact that many students declared that they had fun in the process, some students still preferred more traditional methods of teaching. This study was carried out on a new mathematical concept on which the effect of game-based teaching had not been tested before. The highlight of this study is the effectiveness of game-based mathematics teaching on the place value concept.

Keywords: Game-Based Learning, Students’ Success in Mathematics, The Teaching of Place Value

DOI: 10.29329/ijpe.2022.467.1

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INTRODUCTION

One of the most important arithmetical concepts to be learned by children in the early elementary grades is that of place value. Typically, children show a rapid improvement regarding their place value understanding in second-grade mathematics (Landerl, 2013). The best way to learn place value is through the use of procedural and conceptual knowledge dimensions in tandem (Van de Walle et al., 2016). Students who are in the procedural information stage can understand two-digit numbers and their representations in writing and reading. In the conceptual information stage, students are able to regroup, decompose, and show different representations of numbers (MacDonald et al., 2018; Wilkinson, 2017). This concept is directly related to a number of subcategories within primary school mathematics (Wilson, 2016). Place value concept knowledge is requisite for students to understand numbers, make sense of numbers (Thompson, 2000), and understand all arithmetic algorithms in mathematics (Dietrich et al., 2016). A lack of place value understanding adversely affects the ability to succeed in other mathematical concepts and operations (Moeller et al., 2011). If students do not understand place value concepts, they cannot perform mathematical skills such as rounding off to the nearest tens and hundreds (Van de Walle et al., 2016), making arithmetic calculations, comparing multi-digit numbers (Dietrich et al., 2016), solving problems, understanding divisibility laws, prime numbers and exponential numbers (Sharma, 1993), making operations about decimals and fractions (Herzog et al., 2019), and preventing misconceptions in numerical calculations (Kamii & Joseph, 1988; Sari & Olkun, 2019). Previous research suggests that the place value concept cannot be effectively understood by primary school students with the current instructional methods used in classrooms today (Dinç-Artut & Tarım, 2006; Herzog et al., 2019; Sari & Olkun, 2019; Thouless, 2014).

The place value concept can be learnt by using different methods in contrast to current learning methods in classrooms today (Russo et al., 2021). One of these methods is game-based teaching. This method can be defined as integrating a game in a course (Tajata, 2019). Educational games which include mathematical activities facilitate the teaching of concepts, thereby enriching mathematics programs (Ernest, 1986). In this manner, these games can ensure the transformation of abstract concepts into concrete concepts (Wilson, 2016). In other words, the abstract structure of mathematics can be made clearer and more concrete through the implementation of game-based activities (Song, 2002). The fact that the place value concept is also an abstract structure (Arslan et al., 2011; Dinç-Artut & Tarım, 2006) leads many to believe that place value can be learned via educational mathematics games. Moreover, students have the opportunity to enhance their knowledge in a rich learning environment through educational games (Campos & Moreira, 2016). Thus, game-based mathematics activities can create more meaningful learning environments for many subjects in mathematics (Bragg, 2012a; Cohrssen & Niklas, 2019; Çalışkan & Mandacı Şahin, 2019; Demir, 2016; Skillen et al., 2018; Song; 2002; Lee & Choi, 2020; Liang et al., 2019; White & McCoy, 2019), and they have previously been shown to increase students’ motivation and interest as a source of inspiration in the mathematics learning process (Deng et al., 2020; Gürbüz, et al., 2014; Kiili et al., 2018; Kebritchi et al., 2010; Rondina & Roble, 2019; White & McCoy, 2019).

Bragg (2012a) stated that games increased students’ mathematical learning performance and participation based on 2,100 observations of fifth- and sixth-grade students’ mathematics classes. Cohrssen and Niklas (2019) found that mathematical games had a positive effect on preschool students. Çalışkan and Mandacı Şahin (2019) reported that mathematical games increased second-grade students’ success, and that this process contributed significantly to the affective characteristics of the students’ number estimation (sense) and ability to round off numbers. Demir (2016) suggested that games positively affected first-year students’ cognitive and affective abilities. A study by Song (2002) reported that primary school students could easily comprehend fractions and operations using gamification. Skillen et al., (2018) stated that a linear number board game had a positive effect on the development of mathematical competencies in six-year-old children. The results showed that playing the game led to stable improvements, especially in mathematical competencies of the first and second level of the underlying development model. Lee and Choi’s (2020) study presents results of a tablet-based math game intervention to enhance early numeracy skills of children in Tanzania. Score gains in
the intervention group were substantially greater than those in the control group. White and McCoy (2019) explored game-based learning as fifth-grade mathematics students completed a brief unit on ordered pairs utilizing game-based lessons. The results revealed that student attitudes improved both toward the lessons and toward math in general. Liang et al. (2019) found that a mathematical game intervention improved the number sense level and growth rate of preschoolers in rural areas.

Deng et al. (2020) examined the perceptions and experiences of a teacher and students in a Shanghai public primary school when digital games were used in a second-grade math class. Digital gameplay, when used once daily over a six-day period was found to enhance student engagement and interest in learning in many students. Gürbüz et al. (2014) investigated probability teaching with gamification in primary schools. The research results showed that game-based instruction methods facilitated the understanding of mathematical concepts and increased students’ motivation towards mathematics lessons. Additionally, game-based learning reduced mathematics anxiety based on students’ verbal expressions. These results show similarities with a study by Kebritchi et al. (2010). Students better understood mathematical concepts, had greater success in their mathematics classes, and focused better on mathematics courses. The main aim of the study by Kiili et al. (2018) was to investigate the educational potential of a game-based math game competition to engage students in learning rational numbers. The results indicated that students benefited significantly from participating in the competition and that playing behavior could be used to assess students’ rational number knowledge. Moreover, students were engaged in the competition and the results revealed that intrinsically motivating factors such as enjoyment and perceived learning gains predicted students’ willingness to participate in math game competitions again. Rondina and Roble (2019) conducted a study to investigate the effect of game-based design activities on students’ achievement scores in algebra. The results of study showed that the mathematics game-based design activities demonstrated a positive influence on students’ learning gains in algebra. They stated that offline and online game-based activities in mathematics are a promising approach to be explored by teachers to ignite students’ interest and motivation in learning mathematics.

Regarding the gamification of mathematics lessons, extensive research has shown that games are effective in helping students better understand mathematical concepts. It would seem likely that understanding of the concept of place value will be achieved more effectively by students through the use of gamification. However, we saw that there are a limited number of studies on the teaching of place value concepts with gamification. Broadbent (2004) investigated what kinds of strategies to use to understand the base ten number system in her study with primary school students. Students used game-based activities with bundles of sticks. The results show that games contribute to students’ understanding of concepts and that students can develop different strategies in the process. However, more research is still required. This study looks to build on previous research at the primary school level and determine the effects of mathematical game processes on the learning of a new mathematical concept (place value) in primary school. Specifically, the following questions will be addressed:

1. Is there a statistically significant difference between the experimental and control groups according to their pretest and posttest mathematics scores?

2. How are students affected by game-based mathematics teaching in terms of affective, cognitive or meta-cognitive, psycho-social, and psycho-motor domains?

**METHODOLOGY**

**Model**

A convergent/parallel mixed-method research design, which is the basic design of the mixed methods, was used. Mixed-methods research is an approach that involves collecting, analyzing, and intentionally integrating qualitative and quantitative data in a study. With the growing interest in mixed-methods research across countries and disciplines, researchers have used mixed-methods research to better understand complex research problems (Toraman, 2021). Both quantitative (pretest-
posttest) and qualitative data (teacher diaries, interviews, video, and audio recordings) collection tools were used in this study. The datasets were analyzed, interpreted and reported.

**Study Group**

The study group consisted of 51 second-grade students and their teacher. The participants in the research were chosen through convenience sampling from a primary school in Istanbul where one of the researchers is a teacher. Students were accepted as volunteers for the study. The students were aged seven-eight years old and were randomly assigned into two groups, consisting of 26 students (15 girls and 11 boys) in the experimental and 25 students (12 girls and 13 boys) in the control group. Their teacher was a 33-year-old female who had been working for eleven years in a state primary school.

**Data Collection Tools**

The quantitative data were obtained from two different achievement tests/scales used to answer the first question of the study. The qualitative data were collected to answer the second question of the research by using semi-structured interview forms, teacher’s diaries, video recordings and audio recordings.

*Achievement tests* were used to collect quantitative data. The tests contain five open-ended questions to measure this learning outcome: “Students are able to name the digits of numbers less than 100 in models, and demonstrate the place values of the digits” (Ministry of National Education [MoNE], 2018). Two different achievement tests with parallel questions were used for this attainment. The pretest was used to determine the readiness level of the place value concept. The posttest was used to determine the effect of the applied instruction methods for mathematics teaching on the development of the place value concept. Questions were presented as in the example below:

![Figure 1 The First Question of the Pretest](image)

**Semi-structured interview forms** were used to collect the qualitative data. The participants responded to the semi-structure interview questions. The first question was “When you compare the game-based learning process and the conventional learning process, in which way would you prefer to learn mathematics?” (‘Why?’-probe question). The second question was “How did the game-based teaching process affect your learning or reinforcement of the place value concept?” (“Can you explain your answer?”). The third question was “How did you feel during the game-based instruction process?” (“Can you explain your feelings?”). A total of twenty-six second-grade primary school students participated in the interview process and were recorded via audio.

Teacher’s diaries were also used as a part of the qualitative data. One researcher attended the experimental process as a participant-observer. These observations were used to determine the possible effects of the gamification process on academic success and affective skills. All observations were written weekly.
Audio and video recordings were also used to confirm the statements made in the student interviews and teacher observations. Audio and video recordings were used for the description of the game-based mathematics teaching processes. At the end of the process, four forty-minute sessions were recorded.

Games Used in this Research

Four mathematical games were selected for this study based on literature reviews and experts’ opinions. “Who Wants to Win a Smiley Face?” was an adaptation of a competition program. “What Number Do the Cards Show?” was an adaptation of an activity in a mathematics textbook (Van de Walle et al., 2016). “Surprise Boxes” and “My Names of the Place Value” were anonymous games selected from a collection in the education informatics network (EIN). The selected games in this study were piloted with 60 students. No difficulties were encountered during the piloting process. The games were used during class hours. These games are intended to teach this learning outcome: “Students are able to name the digits of numbers less than 100 in models, and demonstrate the place values of the digits” (MoNE, 2018).

Implementations

The research data were collected in the fall semester of the 2018-2019 academic year. Prior to the implementation process, parents, teachers, and students were informed about the experimental processes. Subsequently, the pretests were applied. The experimental study was carried out with the 26 students in the experimental group, who were exposed to game-based mathematical activities (games), whereas conventional instruction and activities (course book activities and paper-and-pencil exercises) took place in the control group (four weeks). Both the teacher’s observations and video and audio recordings were collected over the four-week period. After the experimental processes, the posttests were applied to both groups. After the posttest, one of the researchers interviewed the students in the experimental group at the end of every school day. Each student was interviewed for about 10 minutes. These meetings took about one week. During the meetings, the students were asked the three questions in the semi-structured interview form, and their opinions about the gamification teaching process were recorded.

Data Analysis

The data of the study were analyzed with a colleague who is an academician. The achievement tests were evaluated by using a rubric developed by the researchers. The first theme involved writing place value names. For this section, 5 points were given for each correct answer. The highest score that a student could achieve from this section was 10 points. The second theme consisted of writing place values as numerals. The second section was scored in the same way as the first section. The total achievement scores of the students were calculated. The data (total achievement scores) distributions were tested. It was determined that the data were normally distributed statistically. Therefore, all quantitative data were statistically analyzed using parametric tests. For the first question, a t-test analysis was conducted to determine the cognitive effects of game-based mathematics teaching. Cohen’s d (2013) was calculated for the effect size.

The semi-structured interview forms and teacher’s diaries were analyzed using content analysis. Firstly, data obtained from the audio recordings of the semi-structured interview forms were transcribed by the researchers. Secondly, the teacher’s diaries and written expressions collected from the semi-structured interview forms were read repeatedly to extract detailed information. Thirdly, the data were separately coded and combined into themes by both researchers. Fourthly, the themes were compared from the point of view of their similarities and differences. Similar codes were subsumed under the themes. The codes and themes were discussed and checked by the researchers. Consequently, ten codes and six themes were generated from the teacher’s diaries. Since only one case was observed for two themes in the teacher’s diaries, no code was created. The relationships of the created themes and codes are summarized in Figure 2.
Figure 2 Relationships of Themes and Codes in Teacher’s Diaries

Twenty codes and eight themes were created from the semi-structured interview forms. The relationships of the created themes and codes are presented in Figure 3.
Figure 3 Relationships of Themes and Codes in Semi-Structured Interview Forms
The created codes and themes are presented with frequency values. For the students’ direct statements, students were given a code, such as S1 (first student), S2 (second student), etc. The researchers used the codes GO-1 (first game observations), GO-2 (second game observations), etc. to report the teacher’s diaries. The audio and video recordings were used for consistency between the teacher’s diaries and students’ opinions. Both researchers’ observations about the audio and video recordings have been reported. Students’ interactions are presented to illustrate the basis of the determinations.

Validity and Reliability

Three different second-grade mathematics textbooks approved by the Ministry of National Education [MoNE] were used to create the achievement tests. At the end of the investigation process, ten open-ended questions were prepared. The ten questions were checked by the experts: two primary school teachers, one Turkish language teacher, and one academician in mathematics education. Thus, compliance with measurement and evaluation criteria and content validity were ensured. A pilot study of the achievement test questions was conducted with 48 second-grade students. The results of the pilot study showed that the questions were clearly understood by the students. Finally, the 10 questions were divided into two tests, each with five questions. Pearson correlation coefficients were calculated for interrater reliability of the achievement tests (R=0.941). This value is accepted as a high correlation between raters. Since the achievement tests were equivalent to each other, the reliability coefficient of the parallel tests was conducted (p=0.729). A high correlation value indicates that the tests are reliable (Büyüköztürk et al., 2018). The three questions in the semi-structured interview forms were evaluated by the experts: two primary school teachers, one Turkish language teacher, and one academician in mathematics education. As a result of this evaluation, positive opinions were expressed by the experts about the semi-structured interview forms. A pilot study was carried out on the comprehensibility of the questions with ten second-grade student volunteers. Again, the students clearly understood the questions in the pilot study. In order to increase the reliability of the code and theme determination processes, the degree of consensus between the coders was calculated based on the Miles and Huberman (1994) formula \[ \Delta = \frac{\sum (\text{coder 1} - \text{coder 2})}{\sum (\text{coder 1} + \text{coder 2})} \times 100 \] This value was calculated as 83%. Miles and Huberman (1994) accepted this value as important for consistency.

RESULTS

Quantitative Data Results

Statistical analysis for the first question of the research, that is “Is there a statistically significant difference between the experimental and control groups according to their pretest and posttest mathematics scores?” is presented in this section.

Comparison of Pretest and Posttest Scores for Experimental and Control Groups

Independent samples t-test analysis was conducted to determine the pre-knowledge of the students about the place value concept. The related results are given in Table 1.

Table 1 Pretest Results of the Experimental Group and the Control Group

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>26</td>
<td>62.50</td>
<td>15.50</td>
<td>0.23</td>
<td>48</td>
<td>0.81</td>
</tr>
<tr>
<td>Control group</td>
<td>25</td>
<td>61.44</td>
<td>16.77</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

p>.05

Table 1 shows that the participants’ average performances in both groups were almost identical on the pretest. The independent samples t-test also showed that there was no statistically large difference between the students’ average results in the control group (M=61.44; SD=16.77) and experimental group (M=62.50; SD=15.50; t=.234; df=48; p>.05), indicating that the participants’ understanding of the notion of place value was about the same before the intervention.
Independent samples t-test analysis was also used to compare the posttest scores of participants. The results are presented in Table 2.

Table 2 Posttest Results of the Experimental Group and the Control Group

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>F</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Effect size (Cohen’s d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>26</td>
<td>0.43</td>
<td>80.46</td>
<td>14.77</td>
<td>2.69</td>
<td>49</td>
<td>.010*</td>
<td>0.75</td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>69.16</td>
<td>15.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05

Table 2 indicates that the participants in the experimental group (M=80.46; SD=14.77) performed better than the participants in the control group (M=69.16; SD=15.23) on the posttest. An independent samples test for equal variance assumption using Levene’s test (F=.43; t=2.69; p>.05) also showed that there was a statistically significant difference between the participants’ average results in the control and experimental groups (t=2.69; df=49; p<.05). Moreover, an effect size of 0.75 using standardized Cohen’s d indicates a large effect based on Cohen’s criteria. This effect size indicates that the mean of the participants in experimental group is 0.75 standard deviations higher than the mean of the participants in the control group. These results suggest that game-based teaching methods have a noteworthy effect on mathematics achievement in teaching the place value concept.

Qualitative Data Findings

In this section are content analyses for the question of “How are students affected by game-based mathematics teaching in terms of affective, cognitive or meta-cognitive, psycho-social, and psycho-motor domains?”

Findings of Semi-Structured Interviews

Interviews were conducted after the posttests were implemented with the 26 students in the experimental group who participated in the game processes. In these interviews, the students were first asked, “When you compare the game-based learning process and the conventional learning, in which way would you prefer to learn mathematics?” (“Why?”-probe question). For the first question, a number of the students’ responses were under the theme of the “game-based instruction method” (f=19). According to students’ answers in this theme, the codes generated by the researchers were “meaningful learning” (f=13), “learning to learn” (f=1), “readiness to learn” (f=3), “creativity” (f=1), and “positive attitude” (f=1). The others’ answers were under the theme of the “conventional instruction method” (f=7). The subthemes of this theme were defined as “routine learning habits” (f=3), “meaningful learning” (f=3) and “other” (f=1). Some students’ answers to the first question are as follows:

S1: “I like to learn with games. I felt more comfortable.”

S5: “Teaching with games. Playing and learning using games is more effective than learning by doing homework.”

S6: “Conventional instruction, because I understand the lessons better when I can write the numbers down using a pencil and paper.”

S15: “Conventional instruction. Playing games all the time is tiresome.”

S16: “I prefer to learn through games because I can find my own way of learning. When I play mathematical games, I can produce my own solving strategy for problem scenarios.”

S17: “Teaching with games, because it made mathematics a fun subject to learn.”

S20: “Conventional instruction, because that’s how we are taught in our other lessons.”
S22: “I like to learn through games, because I want to play my own mathematical games.”

The second question of the interview was “How did the game-based teaching process affect your learning or reinforcement of the place value concept?” (“Can you explain your answer?”-probe question). The answers to this question were listed under the themes “the supportive impacts” (f=25) and “the same impact” (f=1). The codes of the first theme were created under the following titles: “making sense of the place value concept” (f=12), “strengthening the place value concept” (f=1) and “overcoming learning gaps” (f=12). A separate code was not created for the second theme: “the same impact” (f=1). The responses of some students to the question are as follows:

S2: “There was no difference. I can learn both ways.”
S3: “It had a positive effect. It made it easier to learn the place value concept.”
S4: “Positive. It helped me to consolidate this concept.”
S10: “It had a beneficial effect. I think I understand it better.”
S16: “There was a beneficial effect. I was confused before, but not now.”
S24: “Positive. I no longer make mistakes.”
S26: “It had a wonderful effect. I had some difficulty in understanding place value. Now, I am okay. I can determine place value better and more accurately.”

The last question of the interview form was “How did you feel during the game-based instruction process?” (“Can you explain your feelings?”-probe question). Students answers were collected under the themes of: “enjoyment of learning” (f=17), “high motivation” (f=4), “not being stressed in the learning environment” (f=2) and “improving positive personality” (f=3). The first theme was coded as: “fun” (f=9), “happiness” (f=7), and “not being bored by the course” (f=1). The second theme included the codes of: “being excited” (f=3) and “being interested” (f=1). The third theme consisted of the following code: “being relaxed” (f=2). The last theme comprised the codes of: “self-confidence” (f=1), “self-expression” (f=1) and “belonging to a group” (f=1). Statements of some students are as follows:

S4: “The games excited me.”
S5: “I was happy. The lessons are good like this.”
S7: “I had fun.”
S8: “It was nice to achieve something with my friends.”
S14: “I felt more relaxed in class. I could state my ideas and they were correct.”
S15: “I found it fun. I was not bored during the lessons.”
S17: “I was interested in learning mathematics by playing games.”
S21: “I was excited and curious. I always wanted to know who would win. Some games ended with a pretty close score.”
S24: “It was useful.”
Findings of Teacher’s Diaries

The teacher’s weekly observations notes were collected under six themes. One of these themes was the “cognitive impacts”. Some of the codes that were effective in the emergence of this theme are as follows: “providing meaningful learning” (f=3), “overcoming learning gaps” (f=3) and “forcing the mind to learn” (f=3). Some of the teacher’s notes regarding these themes are as follows:

“They learned the place value concept better through the use of the game’s concrete materials. Therefore, some things that they did not previously understand became clearer.” (GO-1)

“They exhibited all their mental and physical capacity to succeed... This was an essential opportunity for them to think creatively and enabled them to structure their knowledge through their own experiences in this process. They were also able to easily transfer this situation to new statements... Their learning was more meaningful. Their mistakes gradually decreased... They discovered how to direct their own learning and to have a greater say in their learning.” (GO-2)

“As they gained experience in the games, they were able to transfer their knowledge more quickly and effectively to the learning environment.” (GO-3)

The “metacognitive impacts” were also observed in the students. For this theme, the “creativity” (f=4) and “metacognitive awareness” (f=3) codes were generated. Some examples of explanatory statements can be given as follows:

“They created alternative ideas... When they did not win, they came together and discussed what they could do to win.” (GO-1)

“I saw them trying different strategies when something went wrong.” (GO-2)

“The third game involved a process based on student ideas from start to finish. They wrote this game’s questions, which were then used in the games we played in the classroom. This significantly improved their productivity... They could make highly effective situation analyses.” (GO-3)

“I observed that my students could use their decision-making, game-making, self-control, and self-management skills.” (GO-4)

The “psycho-social impacts” theme was created for verbal expressions that indicate some social and psychological impact. For this theme, the codes “social skills development” (f=3), “psychological well-being” (f=6) and “positive sense of self” (f=4) were created. Some quotes are as follows:

“They realized that performing cooperatively with each other was effective... Everyone was happy to contribute in order to achieve... My students had fun at the end of this process.” (GO-1)

“They supported each other throughout the game process. This affected the group dynamic positively... They learned to help each other.” (GO-2)

“Learning the correct answers from their colleagues strengthened the communication and learning chain between them... Even if they gave incorrect answers to the questions in the game, the idea of making a mistake impacted on their desire to work together and to learn.” (GO-3)
“It also aided their self-confidence. They were happy to take on individual responsibility on behalf of their groups. They voiced their opinions without hesitation. The third game involved an activity process based on student ideas from start to finish. The fact that they wrote the game’s questions became a part of the game design. This only increased their self-confidence.” (GO4)

The contents of the teacher’s diaries were also gathered under the “affective impacts” theme, and the codes “keeping their interest towards the course alive” (f=2) and “encouragement towards learning” (f=3) were created. Some teacher notes were as follows:

“My first observation was that my students were more enthusiastic about playing mathematical games. The idea of learning some things via gamification excited them. They wanted to learn the game rules as soon as possible so they could learn how to play it. They listened to me with keen interest during the game introduction. The game process led to increasingly active participation and excitement.”(GO-1)

“In the second game of this week, I saw that my students were significantly motivated in the maths classes. My students participated willingly in the second game. They supported each other with a lot of enthusiasm.” (GO-2)

“Students who normally participated very little during the routine maths classes were now excited for their turn to come.” (GO-3)

“The last game was not group-based, but because of gamification, it assigned tasks to students. Starting the game, setting up the game, managing the process, and checking the accuracy of the result were pretty much dependent on them. As always, their willingness to participate was excellent.” (GO-4)

A small amount of physical strength was needed in some games. Thus, the “psycho-motor impacts” theme was created. There was only one situation. For this, a code was not created. Evidence of students actively using their physical strength is presented directly:

“They exhibited all their mental and physical capacity to succeed.” (GO-2)

The last theme created was defined as “other factors”. Because only one item was determined under this theme, a separate code was deemed unnecessary. The observed situation is the noise that students make during games such as cheers, applause, etc. Evidence is presented in the form of the teacher’s direct statement:

“There was a great deal of noise in all the game processes. But this is natural as the children were very excited when playing the game. They could not control their enthusiasm.” (GO-4)

Findings of Video and Audio Recordings

The video recordings for each game were inspected by the researchers for the consistency of student views and teacher observations. Points determined by both the researchers and teacher were reported as follows: Students’ willingness to participate in the learning environment, high motivation towards mathematics lessons, the low state of anxiety and stress, interest in the lessons and having willingness to succeed in each game task, effective communication among students and collaborative teamwork, leadership, reasoning and self-control skills, presenting creative ideas, a willingness among students to correct their mistakes, reinforcing what has been learned, peer learning, a few noises, and an enjoyable atmosphere.

When the video and audio recordings were evaluated in terms of student opinions, the following were determined: Students had fun, they participated willingly and actively in the math
lessons, and there were excitement and enthusiastic demonstrations such as jumping, clapping, cheering, etc.

From the “Surprise Boxes” game, a dialogue between two students indicates the real positive effects of gamification on the students’ learning processes:

“S1: I was confusing the place of tens and units of two-digit numbers. I was reading incorrectly. Did you think like me?”

“S2: I was confusing them too. I was writing units instead of tens.”

“S1: It was not like that, but now I understand. In a two-digit number, the first digit represents tens and the second digit units. “

“S2: Yeah! It was. The first digit from the left shows how many tens groups. Those that cannot be in a group of ten remain as a unit. And, write the second digit number from the left.”

**DISCUSSION AND CONCLUSION**

This study sought to determine how game-based mathematics teaching affects students’ success when compared with conventional instruction methods when teaching the place value concept in primary school. The research was carried out using mixed methods. The study group consisted of 51 second-grade students and their teacher. For the first question of study, quantitative analysis results show a statistically difference between the pretest and posttest scores of the experimental and control groups students in favor of the experimental group (Table 2). The results indicate that the game-based learning method positively affected the students’ ability to learn the place value concept when compared with the conventional instruction method. The results confirm similar conducted studies (Bragg, 2012a; Cohrssen & Niklas, 2019; Çalışkan & Mandacı Şahin, 2019; Demir, 2016; Skillen et al., 2018; Song; 2002; Lee & Choi, 2020; Liang et al., 2019; White & McCoy, 2019).

For the second question of the study, semi-structured interview forms, teacher’s diaries and video and audio recordings were investigated. Firstly, when the results of the semi-structured interviews were examined, a majority of the students (19 people) preferred the game-based teaching method when learning mathematics. Most of the students who made this choice stated that they better understood mathematics through the games they played in the classroom. Almost all the students saw mathematical games as beneficial for understanding the place value concept. Students’ comments show that the mathematical games reduced misconceptions about the place value concept and supported learning of the place value concept (S3, S10, S24 and S26). Mathematical games provided meaningful learning in this study. These results prove that abstract concepts (like the place value concept) turn into concrete concepts with games, as Song (2002) stated. Only one student in the experimental group stated that she could understand the concept of place value equally well using both methods (S2). The natural learning process of gamification may have kept students mentally active and made them more willing to learn. An active mind can generate more ideas. Therefore, the development of creativity may be supported (S22). In addition, the game processes allowed students to be responsible for their own learning. The games may have had a supportive effect on issues such as effective reasoning, self-regulation, and metacognitive awareness (S16). This finding was also reported by Bragg (2012). In other student answers from this study, students stated that they felt more ready to learn and enjoyed learning. Feeling ready to learn and creating a positive attitude can be attributed to the fact that the games provided students with a learning environment free of stress and anxiety (S1, S17). Students mostly expressed their feelings as: enjoyment (S7, S15), happiness (S5), a sense of curiosity (S4, S21), a positive attitude towards lessons (S17), and achieving something with the group or dealing with something useful (S8, S14, S24). These results corroborate earlier studies (Deng et al., 2020; Gürbüz, et al., 2014; Kili et al., 2018; Kebrich et al., 2010; Rondina & Roble, 2019; White & McCoy, 2019). There were, however, some students (a total of 7) that found the conventional instruction method more effective when learning mathematics. These students perhaps
required the habitual learning processes that are dependent on an instructor at home or at school (S6; S15; S20). These individuals may have also had difficulties in quitting a well-established routine (S6; S20), or they may have been hesitant to take active responsibility for their learning as the games used in this study required of them (S15); in which case it is understandable that those students preferred the conventional instruction methods as a more suitable learning method for their own learning style. Secondly, similar to the semi-structured interview forms, the most prominent themes from the teacher’s diaries were the cognitive, metacognitive, psycho-social and affective effects of the lessons. Cognitive and metacognitive effects were a superior performance in mental processes, overcoming learning losses, effective knowledge transfer, meaningful learning, a reduction in mistakes, the effective use of decision-making ability, creativity, etc. Psycho-social affects can be categorized as being excited, being self-confident, being responsible, having fun, having self-control, peer learning, having a positive attitude, collaborating, and communicating effectively. Affective effects can be presented as active participation, motivation, willingness to attend the lesson, etc. The cognitive and affective dimensions of the teacher’s observations corroborate the fact that students had a high level of interest in the mathematics courses, had a positive attitude, and were cognitively active. These dimensions (active participation, a positive attitude, mathematical creativity, problem solving, self-regulation, and collaboration) are important in terms of achieving success in the mathematics curriculum (MoNE, 2018). The research results show that significant mathematical skills targeted in the curriculum can be gained through mathematical game processes. Psycho-motor and other impacts were not as obvious as the others. Only the noises in the theme of other impacts were also seen in the study by Gürbüz et al (2014). Thirdly, it emerged in some dialogues among students and common opinions of the researchers that through games, a lack of knowledge in the concept of place value can be solved, erroneous learning can be corrected, some basic information can be created, and high motivation for mathematics learning can be provided. According to Van de Walle et al. (2016), it is not enough to have a concrete mental substructure (having the level of mental development to understand mathematical concepts) in order to learn mathematics. Learning mathematics also requires students to take an interest in the lessons and develop a positive attitude towards the lessons. In this study, the mathematical games contributed both emotionally and mentally to the students’ success in better understanding the place value concept.

When the quantitative and qualitative results of this research are integrated, the results show that game-based mathematics teaching is effective on learning the place value concept in terms of the affective, cognitive or meta-cognitive, psycho-social, psycho-motor domains. However, a small number of students did not prefer game-based learning in their mathematical learning process. Future research can investigate the reasons for their choice among students who prefer the conventional instruction method in a new qualitative study.

REFERENCES


Ministry Of National Education [Mone]. (2018). *Matemat Ders Öğretim Programı* (İlkokul Ve Ortaokul 1, 2, 3, 4, 5, 6, 7 Ve 8. Sınıflar)[Mathematics Course Curriculum (Primary And Elementary School 1, 2, 3, 4, 5, 6, 7 And 8 Grades)] Http://Mufredat.Meb.Gov.Tr/Dosyalar/201813017165445matematik%C4%B0k%2%C3%96%4%9eret%C4%B0m%20programi%202018v


Strategies Used by Turkish Teachers in Teaching Comprehension (Reading) in Turkish Lesson Teaching Process*

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Abstract

The aim of this research is to determine the strategies used by the 8th grade Turkish teachers in the teaching-learning process of the Turkish lesson for teaching comprehension (reading). The model of the research is the case study model, which is one of the qualitative research methods. The participants of the research are five Turkish teachers who gave eighth grade Turkish lessons in the 2019-2020 academic year and participated in the study voluntarily. "Observation form" and "Semi-structured interview form" developed by the researcher were used as data collection tools in the research. In the development of measurement tools, literature review was used, expert opinion was taken and the level of agreement between coders was checked. Descriptive statistical techniques (frequency, percentage, mean, etc.) were used in the analysis of the data. As a result, it has been determined that the most used strategy by the teachers participating in the study for teaching comprehension in the Turkish lesson learning-teaching process is the question-answer strategy.

Keywords: Reading, Comprehension, Comprehension Strategies, Observation, Comprehension Teaching

DOI: 10.29329/ijpe.2022.467.2

* This study was produced from the doctoral thesis supported by the Scientific Research Projects Coordination Unit of Hatay Mustafa Kemal University within the scope of the project numbered 17.D.005.

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INTRODUCTION

There have been many studies on teaching reading comprehension (Pressley & Allington, 2015; Durkin, 1978-1979; Dole et al., 1996). Some of these studies focused on the use and teaching of reading strategies and found that these strategies play an important role in students' understanding (Schiefele et al., 2012; Aghaie & Zhang, 2012; Brown, 2008; Brown et al., 1996).

In the studies, there is a general view that reading comprehension education should help students develop “the ability to learn from the text” (RAND Reading Study Group, 2002:29). However, the long-term goal is to help students learn to be strategic readers, independent graspers, and critical thinkers with the ability to effectively access a variety of texts they will encounter at school, life, and work (Pressley & Allington, 2015).

Because reading comprehension education involves developing instructional strategies and reading skills, it is necessary to briefly define the two terms that are often used interchangeably in research and practice. Dewitz, Jones, and Leahy (2009) found that the two terms are used interchangeably and frequently in their studies on comprehension education. In some of the programs they reviewed, comprehension strategies such as previewing and guessing were also labeled and taught as comprehension skills. For the purpose of this study, a reading comprehension strategy is defined as a cognitive or behavioral action implemented under certain contextual conditions to improve some aspects of comprehension (Graesser, 2007). Duffy (2002:30) stated that the word “strategy” refers to the technique by which readers learn to control as a means of better understanding. On the contrary, skills are “procedures performed in the same way every time without conscious thought (Block & Duffy, 2008).

Afflerbach, Pearson, and Paris (2008) examined the issue and defined reading strategies as follows: “Efforts to control and change the reader's efforts to decode the text, understand the words, and construct the meanings of the text”. In their view, a reading strategy is: a deliberate, conscious, metacognitive action (p. 368). When this action “becomes effortless and automatic” with practice, the reading strategy then turns into a reading skill (Aghaie & Zhang, 2012). Afflerbach et al. (2008: 368) stated that the concepts of skill and strategy differ in their automatic and non-automatic situations. Concretely, a comprehension strategy is a “deliberate, conscious, metacognitive action that students deliberately perform to help them produce meaning in reading.

To summarize the concept of skill and strategy: Strategy requires less deliberate attention and the student uses it faster and more efficiently. When it becomes effortless and automatic, that is, the student will automatically ask, “Does this make sense?” reading strategy has become a reading skill (Koenig, 2018).

Almasi and Fullerton (2012) support the same idea, emphasizing that strategies are “to help the reader deliberately achieve a goal”. They also stated that instructional activities and exercises, such as the use of graphic organizers or venn diagrams in the processing of text information, are not strategies but mechanical tools waiting to be used to aid understanding by readers. They also explained strategies as thinking processes and actions that the reader deliberately chooses to achieve a reading goal, not as activities required by reading or completing the worksheet in class.

Researchers, who stated that qualified readers participate in certain practices to understand the text, conducted some studies on qualified readers to determine and analyze what these practices are. Pressley and Afflerbach (1995) analyzed and summarized more than 40 studies to identify practices and strategies used by qualified readers. The participants in his studies ranged from sixth grade to university professors. The study was diverse in terms of text types as well as the variety of participants. The texts used in the studies were suitable for some participants and not for others. Researchers have argued that this diversity will make a positive contribution in terms of increasing the power of analysis in the research. They believed that this would logically expand the types of skills and processes to be observed in their research. This helped them to produce more comprehensive and
accurate research results. It is a prerequisite for the participants to be seen as qualified (competent) readers that all participants participating in their research do not lack decoding related to the text read. These participants were asked to describe their thinking processes and what they did before, during, and after reading.

After the analysis was completed, Pressley and Afflerbach (1995) identified practices used by qualified readers before, during, and after reading. They concluded that qualified readers are active readers at every stage. According to these results, they classified the practices/strategies that help qualified readers to understand as follows:

**Before Reading**

- Creating a target for reading the text;
- Text overview (review);
- Deciding to read only certain chapters;
- Deciding to stop reading when the content in reading is not relevant to current reading goals;
- Activating their prior knowledge;
- Summarizing what is obtained from the preview of the text, and
- Creating an initial hypothesis about what the text is about, based on general guesses (Pressley and Afflerbach, 1995:32-33).

While reading, talented readers continue to demonstrate practices that help them understand. Some of these apps are:

**During Reading**

- Generally correct reading of the text from beginning to end;
- Reading only certain sections that are believed to contain critical prior knowledge of the genre, author style, or writing structures used in the review
- Review
- Read aloud
- Repetition/re-expression of a thought that occurs during reading
- Note taking
- Pause reading to reflect on text
- Re-reading parts of the text
- Searching for some related words, concepts or ideas in the text and using them to create the main idea or summary
- Searching for phrases in the text
After reading, talented readers decide what to do with what they read. These practices are a critical stage for reading comprehension.

**After Reading**

- Re-reading as needed after the first reading
- Memorizing the text
- Listing the information in the text
- Creating a coherent summary of the text
- Asking self questions about text content
- Imagining information in the text based on assumptions
- Thinking and interpreting the information contained in the article
- Re-reading to check the accuracy of predictions made before reading
- Continually assessing and reconstructing the understanding of the text
- As the meaning is restructured, the answers given about the text change
- Mentally coding the information in this text for later use (Pressley & Afflerbach, 1995:58-59).

In summary, the findings suggest that skilled readers are active readers who use comprehension-clarifying practices to develop conscious and sustained meaning. Comprehension improves when readers use their overviews or previews of the text to improve comprehension while reading. Initial understandings (predictions) are confirmed or modified by the reader as a more thorough reading takes place. When the reading is complete, the reader may be dissatisfied with what he has understood and may use strategies such as summarizing or asking questions about the text.

Skilled readers use two types of practices to understand text: skills and strategies. However, they are not always clearly defined or categorized as finite (Afflerbach, Pearson, & Paris, 2008). It is seen that the skills and strategies may vary according to the proficiency of the reader and the reader may use a certain application as a skill in one and a strategy in the other depending on several factors.

Many researchers working in the field of reading agree that teachers can help their students understand the text while reading (Almasi, Garas-York, & Shanahan, 2006; Stahl, Jacobsen, Davis, & Davis, 1989; Taylor et al., 2003). Despite this, many teachers do not implement practices that improve reading comprehension in their classrooms.

After Durkin's (1978-79) study, more than one strategy was developed by researchers working in the field of reading and many studies were conducted on the effects of these strategies on reading comprehension (Temizkan, 2007; Epçaçan, 2008; Duke & Martin, 2015; Karatay, 2007; Luttenegger, 2012; McIntyre & Hulan, 2013; Emre, 2014; Palincsar & Schutz, 2011; Topuzkanamış, 2009; Uyar, 2015). However, very little attention has been given to observational studies on what happens in classrooms related to the process of teaching comprehension (reading). The only study conducted in this area in our country is Ateş (2011) on the teaching process of the 4th grade Turkish lesson. In the literature review conducted by the researcher, it has been determined that such a study has not been conducted at the secondary school and higher grade level in Turkey. In this study, it was tried to determine what the 8th grade Turkish teachers used in teaching comprehension (reading) in the Turkish lesson learning-teaching process, and how often and how they applied these strategies.
METHOD

The model of this research, which aims to examine the practices of secondary school 8th grade Turkish teachers in teaching comprehension (reading) in the Turkish lesson teaching process, is the case study model, which is one of the qualitative research methods. Case studies are defined as “the method in which one or more events, environments, programs, social groups, or other interconnected systems are examined in depth.” (Büyüköztürk et al., 2013). Creswell (2018) defined the case study as a multifaceted study in the qualitative tradition. Yin (2014), on the other hand, defined case study as identifying and capturing the conditions of a daily situation. A case study is also known as a case study.

Participants

The participants of the research consist of five Turkish teachers who taught eighth grades in the 2019-2020 academic year and participated in the study voluntarily. The Turkish teachers participating in the study work in public schools in Hatay. The table showing the information of the teachers who voluntarily participated in the study is presented below.

Table 1. Information about the participants of the study

<table>
<thead>
<tr>
<th>Participants</th>
<th>Working Year</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>Teacher B</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Teacher C</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td>Teacher D</td>
<td>5</td>
<td>28</td>
</tr>
<tr>
<td>Teacher E</td>
<td>5</td>
<td>21</td>
</tr>
</tbody>
</table>

The names of the Turkish teachers participating in the research were coded and given as Teacher A, B, C, D and E. In addition, the names of teachers will be mentioned in this way in the following parts of the study.

Data Collection

The case study is interpretive and occurred in nature. Yin (2014) emphasized that the case study is important in obtaining rich and detailed data and collecting multiple data collection sources. In case studies, documents, archival recordings, interviews, direct observations, participant observations, films, videotapes and audio recordings can be collected as sources of evidence. In this study, data were collected by the researcher through classroom observations and interviews.

As it can be understood from the conceptual framework of the research, comprehension (reading) education is a complex subject. A thorough examination of all comprehension (reading) teaching practices used by teachers is required to understand the tiniest elements of effective comprehension (reading) teaching. As used extensively in this study, monitoring teacher practices means both a broad and profound approach. By doing this, the researcher tried to summarize the teacher's practices by observing the practices of the teachers during the comprehension (reading) education in the classroom.

Data Collection Tools

In this study, it was aimed to determine the applications of the 8th grade Turkish teachers in the secondary school for comprehension (reading) education and the time they allocate to these applications with the semi-structured observation technique. The applications made by the teacher during the observation were coded into the observation form by the researcher. In addition, the researcher made a sound recording during the observation. Tierney and Lincoln (1994) suggested that a subjective distance is necessary in such a study and that it should be treated without prejudice. While observing the teachers during their education, the researcher tried to assume the role of an impartial
observer without disturbing as much as possible in order to obtain a true picture of the teachers in their natural classroom environment.

Turkish lessons in our country are carried out through the texts included in the themes in the textbooks. Below is a table regarding the themes, texts, text types and observation period in which the researcher observed the teachers.

Table 2. Theme, texts and duration observed in the learning-teaching process

<table>
<thead>
<tr>
<th>Participants</th>
<th>Thema</th>
<th>Text Name</th>
<th>Text Type</th>
<th>Duration (lesson)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
<td>Individual and Society</td>
<td>Sidewalks</td>
<td>Poetry</td>
<td>5 lesson</td>
</tr>
<tr>
<td></td>
<td>Science and Technology</td>
<td>E-Diseases in Our Daily Life</td>
<td>Informative</td>
<td>5 lesson</td>
</tr>
<tr>
<td></td>
<td>Our National Culture</td>
<td>Epic of Migration</td>
<td>Narrative</td>
<td>5 lesson</td>
</tr>
<tr>
<td>Teacher B</td>
<td>Individual and Society</td>
<td>Sidewalks</td>
<td>Poetry</td>
<td>5 lesson</td>
</tr>
<tr>
<td></td>
<td>Science and Technology</td>
<td>E-Diseases in Our Daily Life</td>
<td>Informative</td>
<td>5 lesson</td>
</tr>
<tr>
<td></td>
<td>Our National Culture</td>
<td>Epic of Migration</td>
<td>Narrative</td>
<td>5 lesson</td>
</tr>
<tr>
<td>Teacher C</td>
<td>Individual and Society</td>
<td>Sidewalks</td>
<td>Poetry</td>
<td>5 lesson</td>
</tr>
<tr>
<td></td>
<td>Science and Technology</td>
<td>E-Diseases in Our Daily Life</td>
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<td></td>
<td>Our National Culture</td>
<td>Epic of Migration</td>
<td>Narrative</td>
<td>5 lesson</td>
</tr>
</tbody>
</table>

As can be seen in Table 2, a total of 5 Turkish teachers were observed for 75 lesson hours (3000 minutes) in the study. The process of processing poetry, informative and narrative text types of all teachers participating in the research was observed by the researcher.

The last stage of qualitative data analysis is the stage of checking the accuracy of the findings. Confirmation of the findings can be achieved by testing the results obtained (Merriam, 1998). According to Fidan and Öztürk (2015), it is important that different coders encode the same data set and that this coding has a high similarity rate. The closeness of this similarity ratio is important in determining the reliability of qualitative research. In order to ensure the reliability of the form, the method of "consistency between the evaluators" was used. For this purpose, the researcher studied the qualities of the observation form with the second observer who is an expert in the field of Turkish teaching. For the reliability study of the content analysis codes in the evaluation of the observation form, the formula $\Delta = \frac{C}{(C + \delta) \times 100}$ developed by Miles and Huberman (1994) to determine the reliability level between the coders in qualitative studies was used. The reliability result of the observation form (.93) was found by using the reliability formula developed by Miles and Huberman (1994). Based on these results, it was accepted that the agreement between the coders was sufficient in the observation form.

Data Analysis

As the type of research in the data analysis process, the researcher has followed several consecutive steps from specific to general in qualitative data analysis. These steps are as follows:

Step-1: Observation data were arranged and prepared for analysis. This step is the stage of recording the voice recordings of teacher observations on the computer, writing, categorizing and classifying the notes kept in the field.
Step 2: All data were read and analyzed by the researcher and an expert in his field. This step allowed us to reveal the general structure of the research. It gave the researcher an idea about which comprehension (reading) methods the participants used and what their applications were in this subject.

Step 3: The researcher started to encode all the data he collected into the observation form. At this stage, the audio recordings were also printed in written form and the data was organized by marking the words representing a comprehension (reading) category.

Step 4: The researcher created themes for teaching comprehension (reading) and explained the information to be encoded in these themes. Themes in this category: It has been examined under two headings as comprehension-related and non-comprehension categories.

Step 5: In this last step, the researcher has revealed the value of his original work by interpreting the coded form of the data obtained as a result of his observations. He interpreted what the data he obtained meant, what strategies were used by 8th grade Turkish teachers in teaching comprehension (reading), and how much time he spent on these strategies.

RESULTS

1. The strategies used by the 8th grade Turkish teachers in secondary school for teaching comprehension (reading) in the Turkish lesson teaching process and the findings on how often they use these strategies

Under this heading, the observed teachers (Teacher A, B, C, D and E);

- Sidewalks (poetry)
- E-Diseases in Our Daily Life (Informative)
- Epic of Migration (Narrative)

There are findings about the strategies used in the teaching process of the texts (pre-reading, reading and post-reading strategies) and how often they use these strategies.

Table 3. Comprehension (reading) strategies used by teachers

<table>
<thead>
<tr>
<th>Comprehension (reading) strategies</th>
<th>Teachers</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a goal</td>
<td>A (f) B (f) C (f) D (f) E (f)</td>
<td>N</td>
</tr>
<tr>
<td>Review</td>
<td>1 - 1 - 1 -</td>
<td>6</td>
</tr>
<tr>
<td>Activating prior knowledge</td>
<td>5 4 4 4 3</td>
<td>20</td>
</tr>
<tr>
<td>Examine images in text</td>
<td>2 1 1 2 1</td>
<td>7</td>
</tr>
<tr>
<td>Prediction practices</td>
<td>3 3 5 5 4</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>11 8 14 13 10</td>
<td>56</td>
</tr>
<tr>
<td>Reading for the purpose of reading</td>
<td>2 1 3 - -</td>
<td>6</td>
</tr>
<tr>
<td>Underline</td>
<td>- - 2 1 -</td>
<td>3</td>
</tr>
<tr>
<td>Take note</td>
<td>1 - 1 - -</td>
<td>2</td>
</tr>
<tr>
<td>Ask questions</td>
<td>80 74 123 96 91</td>
<td>464</td>
</tr>
<tr>
<td>Monitoring comprehension</td>
<td>3 2 1 1 2</td>
<td>9</td>
</tr>
<tr>
<td>Re-reading</td>
<td>1 2 3 1 -</td>
<td>7</td>
</tr>
<tr>
<td>Make inferences</td>
<td>5 4 4 6 3</td>
<td>22</td>
</tr>
<tr>
<td>make a connection</td>
<td>- 1 2 - -</td>
<td>3</td>
</tr>
<tr>
<td>Discuss while reading</td>
<td>- 1 2 1 -</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>92 85 141 106 96</td>
<td>520</td>
</tr>
</tbody>
</table>
When Table 3 is examined, it is seen that Teacher A 173, Teacher B 147, Teacher C 226, Teacher D 182 and Teacher E used the comprehension (reading) strategy 161 times in the Turkish lesson teaching process. If we look at the comprehension (reading) strategies used by the teachers in general, it is seen that the most used strategy is the question-answer strategy (f=737) and the one who uses this strategy the most in the lesson is Teacher C.

According to Table 3, Teachers A, B, C, D and E used strategies before reading (f=56), during reading (f=520) and after reading (f=316) during the Turkish lesson teaching process. It is seen that the participant who used the most strategies before reading (f=14), during reading (f=145) and after reading (f=230) in the Turkish lesson teaching process is Teacher C.

After the question-answer strategy (f=737), the strategies most used by Teachers A, B, C, D and E in the Turkish lesson teaching process; It was concluded that activating prior knowledge (f=20), guessing (f=20), making inferences (f=22), finding the main idea (f=11), summarizing (f=12).

### 2. The Most Used by Secondary School 8th Grade Turkish Teachers (Teachers A, B, C, D and E) for Teaching Comprehension (Reading) in Turkish Lesson Teaching Process; Findings on how they applied the strategies of activating prior knowledge, estimating, inferring, summarizing, asking/answering questions

#### a. Activating Prior Knowledge

All of the teachers (A, B, C, D, E) stated that they carried out this application (usually based on the preparatory work questions on the text in the textbook) through the questions they asked in order to bring the students' prior knowledge of the text to the reading environment during the mental preparation process before starting the text processing process. seen. The teachers had the students read the text preparation questions in the textbook during their practice and asked the students to answer these questions.

As a result, in order to activate students' prior knowledge in the text processing process of Teachers (A, B, C, D, E):

- Students adhere to the questions in the preparatory work in the textbook during their practice of activating their prior knowledge,
- He gave feedback as “yes”, “very nice”, “these can happen” to the answers given by the students,
- In addition, he gives enough time to his students for the questions asked and listens to the answers given by the students without interrupting,
- He asked the questions he asked for the whole class,
- It is seen that he gives feedback on whether the questions he asks are correct or not.
b. Prediction Practices

As a result of the observations made by the researcher, it was determined that Teachers A, B, C, D and E used the prediction strategy in two different ways. These:

• Predicting content based on the title or images of the text
• Prediction the meaning of unknown or keywords in the text

Predicting the content from the title or visuals of the text is the practice that the teachers do before the text processing process. The applications of predicting the meanings of the unknown or keywords in the text were observed as the applications they made during the text processing process.

When the findings are evaluated in general, it is seen that Teachers A, B, C, D and E:

• They use the predicting strategy for students to construct meaning from the text,
• They adhere to the activities in the textbook while using the prediction strategy,
• It was observed that the students listened to their predictions of unknown words or keywords in the text based on the title or visuals of the text, gave sufficient time and gave feedback to the students about the accuracy of their predictions.

c. Make Inferences

As a result of the observations made by the researcher, it was seen that Teachers A, B, C, D and E performed their inference-making practices for the text according to the activities in the textbooks. The teachers carried out inference practices through the questions they asked their students.

It has been observed that teachers A, B, C, D and E's inference practices are generally about revealing the meanings of words and sentences in the text read, and that teachers aim to establish a connection between their students' prior knowledge, dreams and assumptions in this way.

As a result of the observations, it was determined that the teachers applied the inference strategy in three different ways. These:

• Making inferences about the details supporting the text
• Making inferences to find the main idea / main emotion
• It is in the form of making inferences about the figurative language used by the author.

As a result, the teachers had their students make inference applications for the details supporting the text in order to enable them to compare the information in the text with the information not included in the text; It was observed that they asked their students to infer possible cause-effects.

d. Summarizing

It was observed that Teachers A and E did not include any kind of summarization practice in their classes. The practice of summarizing was observed in Teachers B and C's classrooms when only the text "Epic of Migration " was being processed, while in Teacher D's classrooms only the " E-Diseases in Our Everyday Life " text was being processed.

As a result, it has been observed that the teachers do not give much place to the applications of summarization strategies in the text processing processes. Before starting to use the summarization strategy, the teachers started with the sentence "We have read the text, now let's summarize it briefly".
This shows that the teachers acted with the view that the summary should be short and concise, important places in the text should be specified and detailed information should not be included.

e. Asking/Answering Questions

Teachers A, B, C, D and E generally used the questioning strategy for new information encountered during reading. The questions asked by the teachers before reading are intended to bring students' prior knowledge and predictions into the reading environment and to enable them to understand the text better. The questions that teachers ask during reading are usually “what, why, who and where”. It has been observed that teachers ask such questions during reading in order to attract students’ attention and make them understand better.

Teachers use the question/question-answer strategy in every part of the Turkish lesson teaching process; It was observed that they benefited from the question-answer strategy before comprehension (reading), during comprehension (reading) and after comprehension (reading).

It was observed that the answers to the questions asked by the teachers during the mental preparation process were mostly non-text questions (the answers are not included in the text), and the answers to the questions about comprehension were generally questions that were answered in the text (the answers were included in the text).

As a result, Teachers A, B, C, D and E taught the Turkish lesson by making use of the activities on the text (preparatory work) and under the text in the course book during the learning-teaching process. It was observed that they benefited from the question-answer strategy while performing all these activities. E.g; The teachers carried out all activities related to the text being read, activating prior knowledge, explaining the visual elements of the text, finding and explaining unknown words, determining the main idea-main emotion, guessing, inferring and reading the text.

CONCLUSION AND DISCUSSION

In the study, the frequencies of comprehension (reading) strategies used by 8th grade Turkish teachers and how they apply the strategies they use most were observed. Accordingly, in the Turkish lesson teaching process, it was found that Teacher A (f=173), Teacher B (f=147), Teacher C (f=226), Teacher D (f=182) and Teacher E (f=161) It was determined that he used the (reading) strategy. Teachers used strategies before (f=56), during (f=520) and after reading (f=316). According to these results, it is seen that the teachers participating in the research mostly use the strategy while reading. It has been demonstrated by many studies that teachers' use of strategies in their practice of understanding the text helps students learn comprehension strategies, develop their reading skills, and understand what they read (Temizkan, 2007; Epçaçan, 2008; Duke & Martin, 2015; Karatay, 2007; Luttenegger, 2012; McCown et al. Thomason, 2014; McIntyre & Hulan, 2013; Neuman & Gambrell, 2013; Emre, 2014; Palincsar & Schutz, 2011; Pearson, 2009; Pearson & Dole, 1987; Topuzkanamış, 2009).

In this study, the results of how the teachers use the strategies of activating their students' prior knowledge, estimating, inferring, summarizing, and question-answer are as follows: While using the strategy of activating students' prior knowledge, the teachers had the students read the preparatory work questions in the textbook and asked the students to answer these questions. their wishes have been determined. In our study, the strategy of activating prior knowledge was observed as the most frequently used application in the category of applications for the mental preparation process.

The teachers used the guessing strategy in 2 different ways (1- Estimating the content from the title or visuals of the text, 2- Guessing the meanings of the unknown or keywords in the text). According to the results of the research, it was emphasized that using the guessing strategy could help students improve their comprehension skills (Stricklin, 2011). Brassel and Rasinski (2008) expressed the effective use of estimation strategy as using not only the information obtained from the read text.
but also the information contained in the previously read texts. As a result, it has been observed that the estimation strategy is an effective strategy that supports understanding, and in practice it rarely includes only prediction, and it is often used together with other strategies (Mokhtari & Reichard, 2002; Duke & Pearson, 2008; Janssen, Braaksma, & Rijlaarsdam, 2010).

According to the findings obtained from the observations, it was determined that the teachers used the inference strategy in 3 different ways (1- Making inferences about the details supporting the text, 2- Making inferences about finding the main idea / main emotion, 3- Making inferences about the metaphorical language used by the author). Oakhill and Cain (2007) define inference as filling in details that are not explicitly stated in the text. In addition, studies conducted in this area have stated that qualified readers constantly make inferences, while readers with poor comprehension skills have difficulty in making inferences from the text (Oakhill, 1982, 1984; Cain & Oakhill, 1999; Oakhill & Cain, 2000).

In the study, it was concluded that the teachers did not use the summarization strategy in the text processing process and emphasized that the summary should indicate the important places in the text, should not be detailed and should be short. The lack of summarization activities in the activity part of the texts in the textbook can be shown to the fact that the teachers observed in this study do not use the summarization strategy in the lesson teaching process. There have been many studies showing that teaching summarizing can improve both writing and reading comprehension skills, and that summarizing in writing enables students to interact with texts more intensely and helps them understand better (Fang & Coatoam, 2013; Thiede & Anderson, 2003). The National Reading Panel (NRP) (2000) analyzed 18 studies on summarization and concluded that this comprehension strategy is particularly effective in reading comprehension as it relates to memory and identifies the main ideas in reading.

It was observed that the teachers participating in the research used the question-answer strategy to bring the students’ prior knowledge and predictions into the reading environment, and they generally tried to attract the attention of the students by asking questions such as "what, why, who and where". The strategies most frequently used by teachers are as follows: Question-answer (f=737), inference (f=22), activating prior knowledge and guessing (f=20), summarizing (f=12) and expressing the main idea/main emotion. find (f=11). In our research, it was observed that the comprehension (reading) strategy most used by teachers was the question-answer strategy. In the literature review, it was concluded that the question-answer strategy is the most frequently used in-class application by teachers (Durkin, 1978-1979; Ateş, 2011). It has been observed that teachers also use the question-answer strategy while using other comprehension strategies, and most of the questions in the classroom are asked by the teachers during the text processing process. Studies have shown that the use of question-answer strategy in teaching comprehension shapes students' long-term learning behaviors and reading the text in certain ways, and when most of the questions in the classroom are asked by the teachers, students become cognitively passive and get used to finding answers from the text (Duke & Pearson, 2008). It was concluded that the questions based on the text improved the readers’ understanding and helped them check what they understood from the text. In addition, it has been suggested by many studies that questions should be asked in order to enable successful readers to focus on the most important information of a text and to identify the places they find difficult to understand (Janssen, 2002; Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989; Wood, Woloshyn, & Willoughby, 1995).

REFERENCES


A Participatory and Democratic Education Administration Model: Local Education Boards

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Abstract

This article presents a mixed method study on how to develop a participatory education management model as an alternative to the Turkish education administration system. Consisting of qualitative and quantitative methods, the mixed research method has been adopted to acquire the required data. Qualitative phase the education administration systems applied in OECD member countries, documents and reports available in the literature were evaluated. To reach wider masses, an online survey aiming at collecting the views of teachers and administrators was carried out by using the quantitative phase of the mixed method. This study has laid it bare that the principles of good governance, common sense, transparency, accountability, participation, democracy, effectiveness, efficiency, and sustainability stand forefront in educational systems that adopt the participatory education boards model. Eventually, a board/commission oriented local education administration model has been designed and developed as an alternative for the Turkish educational administration system.

Keywords: Education Administration, Local Education Boards, Participatory Administration

DOI: 10.29329/ijpe.2022.467.3
INTRODUCTION

Education administration is a special area of Public Administration (Taymaz, 2000, p. 17). Having been formed by the decree having the force of law within the frame of the Organization and Duties of the Ministry of National Education (MoNE), the educational administration structure of Turkey is unitary and centralized so as to function from the top administrative unit to the lowest administrative unit. Educational policies are determined centrally (Balei, 2013, p.27). Decisions are taken by the top authorities and applied to the subunits. Persons to occupy administrative seats are selected and appointed through top-down decisions taken by the Ministry. In general, there is an organization, of which structure is based on “directorates”. Directors of the respective units are appointed according to the principles and procedures specified in the respective laws and regulations. However, the political views of the individuals are usually taken into consideration rather than their competencies while assigning them as directors. Schoolmasters are in the status of civil servants who mostly perform bureaucratic procedures (Açkalın, 2014). Decisions are usually taken and executed by administrative authorities. The state with its national integrity anxiety, strictly centralized, bureaucratic, and vertical hierarchical structures has turned into a giant organism that has lost its ability of thinking. In this sense, the structure and functioning of the centralized National Education System should be changed Şahin (2003).

Accountability, transparency, democracy, administration processes, sustainability, scientificity, participation in decision-making processes, competition, efficiency, and flexibility, all of which are fundamental components of education administration, are generally not taken into consideration in such an educational administration; whatever the administrator says should be accepted without questioning because he/she knows it best. In Turkey, Accountability, transparency, democracy, administration processes, sustainability, scientificity, participation in decision-making processes, competition, efficiency, and flexibility, all of which are fundamental components of administration, are generally not taken into consideration in educational administration. Whatever the educational administrator says should be accepted without questioning because he/she knows everything best. Despite they manage education in this way, most of the scientific studies conducted on the leadership qualities of the education administrators and how they implement and manage education show a high level of satisfaction with school principals (Cemaloğlu & Klınç, 2012, p 165; Göksoy et al., 2013, p. 18; Serin & Buluç, 2012, p. 435; Şekerci & Aypay, 2009, p. 156). In few studies, the failure of these administrators in education administration is highlighted (Summak & Özgan, 2007, p. 261). However, the Program for International Student Assessment (PISA) exam reports and Gross Domestic Product (GDP) averages, which can be considered as tools that best express the economic, social, and educational situation of a country show that Turkey falls far behind the Organization for Economic Cooperation and Development (OECD) average (Table 2 and 4).

The need for such a transformation and introducing a contemporary education administration model as an alternative to the current Turkish education administration system and clear the way towards better standards, constitutes the core of this study. By adopting not only the pragmatic, interpretative, and social constructivism philosophy but also an understanding that life experiences are ontologically important, epistemologically shaped as cooperation and experience, and axiologically based on respect for personal values, this study sought answers to some questions such as “What have the OECD countries done in education administration so far”, “What kind of education administration approach is needed”, and “How we should choose the managing staff”. Methodologically, the mixed research method and an inductive approach have been followed (Creswell 2017:36). This research is a mixed-method study. Using the exploratory consecutive design, the interpretative framework has been followed. The reason for choosing mixed method is that qualitative and quantitative data alone are not sufficient (Creswell, 2019, p. 15).

The authors personally collected the data and added their academic and administrative experiences to methodology and model development. Qualitative and quantitative data were used in the study. Qualitative data were collected from the literature and OECD reports, quantitative data were collected through a questionnaire from teachers and administrators working in Seyhan district with the
permission of Adana Governorship. Test-retest analysis was applied to measure the validity and reliability of the questionnaire. The questions mentioned above have been answered by interpreting the acquired qualitative and quantitative data. The model proposal was created in line with the qualitative data, the academic and administrative experiences of the authors and especially the views of the quantitative sample group.

This study presents an educational administration structure, which is implemented in various countries in education administration but should be implemented for all levels of education that have not been subjected to scientific studies yet. Such studies in the field have generally been conducted as school based. This study covers the entire education administration system and presents a sustainable education administration system based on local education boards model. The study provides an alternative educational administration model for authors and policymakers. It is thought that it will allow new scientific studies to be made to establish the details of the model.

Globalization and neoliberal policies that started in the 1980s with the support of the World Bank (WB) and the Organization for Economic Cooperation and Development (OECD) have brought significant changes in the fields of economy, politics, and administration. Eventually, these significant changes have played a crucial role in taking concrete steps towards the localization in sustainable educational administration (Doğan, 2016, p.1795). The World Commission for Environment and Development (WCED) report that published by the United Nations in 1987 (WCED, 1987) defines the principles of sustainable development. Agenda 21 of the United Nations Conference on Environment and Development (UNCED) “World Summit”, which was held in Rio de Janeiro in 1992, also defines the concept of sustainable development and governance (Güneş & Beyazıt, 2012, p. 26). In 1999 and 2004, the OECD defined the principles of sustainability and governance and made recommendations to all member countries on implementation. The countries, which embraced and reflected the principles and concepts defined in the WCED report, as well as in the UNCD Agenda 21, and OECD's recommendations on sustainability and governance to their education administration system, have achieved to go beyond the world standards in terms of educational, social, and economic development (Table 2 and 4). In spite of engaging in all the aforementioned events as an OECD member country, Turkey hasn't made any change in her education administration system and still maintains her education administration approach that has been going on since 1960s. It is a solid fact that Turkey’s educational administration system needs to undergo substantial change and transformation. Education is such an important issue that it cannot be managed with decisions taken by a single authority. It is necessary to adopt more contemporary administration approaches. An education administration model, which adopts common sense, sustainability, transparency, accountability, inclusive governance, rivalry, democratic values, and participation, will inevitably pave the way for Turkey to achieve the educational, social and economic levels of the developed countries.

Tendencies of regionalization and localization that have emerged as an aftermath of globalization have led to new administration approaches (Ökmen et al., 2004). Concepts such as globalization, localization, governance, privatization, and administrative reform are at the core of these new administration approaches (Baysal, 2017). The concept of governance comes to the fore with an understanding that embraces co-administration, rapid change, customer-orientation, and market-based concepts. Furthermore, it brings a decentralized administration approach, which is based on a society-centered understanding rather than a state-centered-one, to the fore (Ökmen et al., 2004). The public, civil society, and public cooperation constitute the core philosophy of this understanding, and joint administration is essential. It is based on participation and contributes to the development of democracy (Şişman & Turan, 2003). All of these are signs of good governance, and it is necessary to understand thoroughly their theoretical framework in order to apply them appropriately.

Governance theories have come to the fore in the past few decades with the promise of limiting the role of the state and promoting democratic ideals in the delivery of public services, working through local mechanisms such as governing bodies, boards, and councils, rather than those of the state (Villadsen & Dean, 2012, s. 401). This situation is mostly expressed through corporate
governance. Leblebici et al., (2012, p. 88) define the concept of governance in three ways as corporate governance, good governance, and public governance;

"Corporate governance is generally related to the administration and accountability provided by the internal systems and processes in any organization. Good governance is a form of social, political, and administrative governance that has been expanded by transnational and/or international organizations such as WB, UN, OECD, and the EU. Public governance is related to socio-political approaches and public policies, administration, network, and contract governance”.

By underlining the crucial role of accountability, responsibility, transparency in achieving the objectives of the corporate, Bordean et al., (2011) state that corporate governance has a broad scope covering organizational behavior, law, finance, sociology, strategy, and economy. Joint administration makes civil society and public participation stronger than administration led by bureaucratic, political, and expert authority, and ensures a more horizontal, smooth, and democratic administration system. (Gobby & Niesche, 2019). The way corporate governance works varies depending on various factors such as the country’s culture, economic situation, and organizational structures; furthermore, corporate governance is constantly dynamic, and constantly open to adopting the emerging conditions related to competitiveness (Fernández-Fernández, 1999).

Public institutions and especially the business world have been trying to keep up with the administrative changes and continuous development by amending their administration approaches with governance-based administration structures. Especially after the 1990s, developed and developing countries started to manage their administrative structures with working groups called boards or commissions, where decisions are taken by certain groups. The ever-increasing corporate influence in the business world has led to the need of improving the corporate governance framework for the protection of shareholders, and eventually, diversity has become an imperative factor in improving the monitoring and leadership functions of the boards (Pechersky, 2016, s. 87). The Boards are the direct representation of the shareholders in the company and serve as a control and monitoring tool for the protection of the interests of the stakeholders (Pechersky, 2016, p. 89). Boards are preferred as they have a more democratic and proactive role in the administration of the organization (Stevenson & Radin, 2015).

The Boards, which constitute the linchpin of corporate governance, have been defined as the most important part of corporate governance due to their central role in corporate decision making. Boards are the main element of governance and therefore, board elections are very important as well. Many studies available in the literature have adopted agency theory and organizational theory in explaining the role of the Boards in making decisions on behalf of the stakeholders (Chen et al., 2011). Another role of the Boards is to provide key external resources, including legitimacy, advice, advocacy, external funding, and links to other organizations (Chen et al., 2011); the resource dependence theory and transaction cost theory have been adopted to explain the role of the boards in providing external resources and achieving efficiency in cost (Chen et al., 2011). The board considers the presence of the Chairperson and the CEO, whose roles are clearly distinct, as an indicator of its formal structure. Boards consist of a combination of independent internal and external members that formally appointed. Social interactions within the Board may lead to an informal social networking structure. This informal networking may affect the perceptions of the board members in the decision-making processes regarding a series of events. In this regard, board members need to be assigned among individuals, who are independent of the organization, and who are well-equipped and experienced to live up to the administrative expectations (Stevenson & Radin, 2015, s. 427). Fernández-Fernández (1999) puts forth the following recommendations for the selection of the Board of Directors;

“The board should consist of professionals ranging from 5 members to 10 members. These members should select an independent manager among themselves. It should clearly state its mission and general supervisory principles. It should adhere to the principles of transparency
and impartiality. An auditing board should be selected from the executive sub-directors. An independent auditing board should audit the actions of the board of directors. In case of failure, the regulations should stipulate an obligation on the members and chairpersons of the boards of directors to resign. It should an age restriction for the chairman of the board of directors and the executors to be appointed. Board regulation should be prepared to prevent conflicts of interest. Institutional communication mechanisms should be established. External audit reports should be shared transparently. Annual reports should be created and published within the framework of governance principles”.

Pechersky (2016) highlights that it is essential to take into consideration the diversity, creativity, strategic thinking, and decision-making abilities while choosing the members of the board of directors. Again Pechersky (2016) and García-Sánchez et al., (2015) define the diversity as the inclusion of individuals from different industries, non-governmental organizations, and educational background; adding that such a diversity also covers age, ethnicity, and gender. They also highlight that the percentage of women holding corporate board seats has significantly increased. Consequently, having such a diversity in the board have positive effects not only in achieving sustainability, productivity, and improving the overall performance of the corporate but also in reflecting the crucial role of women board members in ensuring the state welfare. Thus, it is concluded that diversity can be valid for a given situation and can be used as a social benefit in re-presentation rather than universal financials (Pechersky 2016). When this result is interpreted for education, the study conducted by Honingh et al., (2020) can be shown as a reference. In their literature analysis about the effect of educational boards on student achievement, they determined that there is a relationship between the internal and external connections of the boards and the achievements of students and that the boards contribute positively to student achievement. Another significant finding of their study is that the participation of parents in the education boards and the diversity in the education boards has positive effects on the quality of education. Similarly, the study conducted by Saatcioglu et al., (2011) concludes that the internal and external connections in school boards are of importance in terms of providing positive contributions to financial issues and academic results. This situation can be considered as a sign that education boards have a crucial role in activating different dynamics in education.

Anderson et al., (2007) underline that the transformation of the board of directors into a strategic business partner of corporates and organizations not only offers the opportunity to produce a superior administration regime, but also has significant impacts on the board monitoring outcomes. This provides opportunity to introduce different perspectives to strategy, risk administration and planning of execution, and to produce better decision results and better performance. Recent studies on the administration point out that cooperation and closer relations between the board and the executors are necessary to reduce the bureaucratic processes and counteract the excessive monitoring and control that could have negative effects on organizational outcomes (Anderson et al., 2007).

In addition to all these, there are also studies that perceive the theory of governance negatively and criticize it harshly. For example, Bayramoğlu (2005);

Bayramoğlu puts forth, “… The theory and practice of governance is a model of political power that surrenders the future of societies to the bare domination of the capital class by excluding all working classes except the ruling class through various mechanisms. Governance, a concept that claims to change administration in a way that includes non-state actors, that is, in the sense of governing together, is a new model of political power. The demand for the removal of all obstacles in front of the market by considering the interests and rivalry priorities of the national capital class, which is under the direct influence of the international capital network, determines the fabric of this governing model.”

Public education systems have undergone various reforms regarding administrative decentralization, corporatization, and strengthening community participation (Gobby & Niesche 2019). In the sense of a paradigm change, this structural transformation stands before us today as a
reality with many economic, social, political, cultural, and administrative consequences (Ökmen et al., 2004). Since the 1980s, the office-professional organization of the public sector of many OECD countries has been transformed into a private sector business image through the policy of economic activism (Rose, 1999). Corporate governance forms adopted by the public sector value and encouraged entrepreneurs. Local administration of resources has provided the opportunity for accountability to the central government through organizational competitiveness, flexibility and revenue seeking, and data-driven auditing and performance comparisons. In many countries, education administration systems have not been affected by the idealization of the companies as a general model of social and economic behavior (Ball, 2007, Gewirtz, 2002).

In recent years, public institutions have undertaken various deep studies in this field and especially school administrations have been introduced with concepts such as joint administration and school-based administration. The process has started with localization and continued with the understanding of school-based administration and decentralization. Thus, societies were given decision-making responsibilities through locally transferred schools and positioned as consumers of public services, corporate governance and leadership types were created, and they started to exhibit entrepreneurial and market-type behaviours (Gobby & Niesche, 2019, p. 586). Having been transferred to the public, schools have attained a controlling and monitoring function for the benefit of society. The impact of this change in the field of administration has also made itself apparent in the education administration system. Some countries manage educational institutions with directors, while others manage educational institutions with boards, councils, unions, or committees (Table 2). Some of these boards are advisory and some are executive boards. To fully understand how the boards/commissions/union or committees manage the corporation or institution, it is necessary to have a good understanding of their establishment and operational structure.

Sezen (2003) refers to the board of directors as a group of people who come together to carry out functions such as making decisions, expressing opinions, or making suggestions, and talks about administrative bodies such as delegations, councils, committees, committees that can sometimes be used synonymously with the board. Highlighting that administrative bodies such as delegates, council, commission, and committees can sometimes be used synonymously to the board, Sezen (2003) defines the board of directors as a group of people gathering together to express their ideas and make decisions required to achieve the best performance. There is no difference between these administrative bodies that refer to the board of directors. The common characteristic of these bodies is that they have multiple leaderships, unlike institutions operated under the administration of a single leader (Sezen, 2003). Power is not in one person's hand; it has been distributed. Several countries have overcome all difficulties and achieved this and consequently, they have achieved high levels in education and economy (Table 2 and 4).

Sezen (2003) states that working with boards/commissions has several advantages as it provides democratization in administration, prevents the centralization of authority, contributes to the establishment of a culture of conciliation, ensures the sharing of knowledge and experience, and creates an appropriate environment for communication and coordination. Besides, Sezer draws attention to some disadvantages as working with boards/commissions can slow down the decision-making process, can lead to the distribution of responsibilities, can turn into an arena of conflicts between individuals and institutions. Sezer also considers it as a disadvantage that the way the boards/commissions are formed can determine the way of functioning. (Board members having political ties negatively affect the work). Despite all the disadvantages, countries that have chosen to manage today's education administration systems with boards have reached very important positions in terms of education quality and economic welfare. Countries that localized their educational administration systems have surpassed OECD averages in PISA tests and achieved gross domestic product exceeding OECD average (Table 4).

Scientific studies conducted on education administration are available in the literature. However, most of these studies have focused on the current education systems, school-centered administration, and school-based boards. However, the business areas, service sectors, and consumer
perceptions that altered with the effect of neoliberalism and rapidly developing technology have made it a necessity to adopt the education board model in all areas of educational administration. The education sector must now be managed like large corporates and must renew itself rapidly in the line with good governance principles. Most of the developed countries (Table 2) have achieved this and the top ranks in terms of development and welfare. This study reveals that all relevant fields of education should be managed with good governance principles through educational boards. This study not only includes the views of education stakeholders but also examines, tabulates, and interprets the educational administration structures of various countries, international exam successes, and OECD development ranks, and consequently proposes an educational model; namely local education boards model, for all units concerning educational administration.

**Purpose of the study:**

This research aims to develop a local education management board model based on boards/commissions for Turkey in line with the education management models of OECD countries and the views of teachers and education administrators.

**Problem Statement**

The Turkish Education Administration system has an extremely centralized structure. Participation of local units and people in decision-making processes is very limited. The education system that based on directorates can't be considered democratic as long as it is subjected to the decisions taken by a single authority. Such an organization in the Turkish education administration system has negative impacts on the quality of education, social life, and sustainable growth and development.

**Sub problems**

1. Education stakeholders in Turkey complain about the education management system.

2. Education stakeholders want a more modern and participatory education management model.

**METHOD**

The mixed research method has been used in this study. This study has adopted to use mixed method as the events and facts are not simple and one-dimensional, the data collected by different methods need to confirm each other and the outcomes need to have strong credibility (Yıldırım & Şimşek, 2013). The exploratory sequential pattern was used as the research design (Creswell, 2019, p.6). Based on the data obtained through qualitative data analysis, a questionnaire called "How to Manage Education" was prepared to be used in quantitative study. The purpose of this design is to collect, analyse, diversify, and compare the results of qualitative and quantitative data and combine the results from two data groups or confirm one data set with another (Yıldırım & Şimşek, 2013; Büyükoztürk et al., 2014; Creswell, 2019, p.6). The survey consists of closed-ended questions, and classified questions where single and multiple options can be marked (Büyüköztürk, 2005). The questions were prepared by making use of the data obtained from the analysis of the education administration models of 16 OECD countries and the literature on boards of directors. The survey was done in line with the principles of the exploratory sequential pattern. Due to multiple answers, the number of "N" exceeds the sample volume.

**Population and Sample**

In the study, purposive sampling method for qualitative data and random systematic sampling method for quantitative data was chosen (Creswell, 2019; Yıldırım & Şimşek, 2013). In order to acquire data through qualitative method, 16 countries, of which PISA test averages and gross domestic
product are above OECD averages, among 36 OECD member countries have been selected as the sample group. Education administration models of these countries were examined. For the quantitative dimension, 8,118 teachers and 696 administrators working in a total of 232 formal and non-formal educational institutions in Adana province Seyhan district in the 2016-2017 academic year were taken as the population.

Yazıcıoğlu and Erdoğan (2004, p. 50) indicates the sample size as 370 for population up to 10,000 for \( \alpha = 0.05 \). Based on this calculation, the sample size in this study has been determined as 370 teachers and administrators. To ensure reliability and validity, the schools in Seyhan district have been listed alphabetically and halved into two groups on the basis of the number of teachers and administrators who participated in the survey (Table 1).

### Table 1 Number of Formal and Non-formal Education Institutions, administrators and teachers in Seyhan District in 2016-2017 Academic Year

<table>
<thead>
<tr>
<th>Item</th>
<th>Non-formal and Formal Educational Institutions</th>
<th>Group1</th>
<th>Group2</th>
<th>Total Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Educational Institutions</td>
<td>115</td>
<td>117</td>
<td></td>
<td>232</td>
</tr>
<tr>
<td>2 Number of Teachers</td>
<td>4075</td>
<td>4043</td>
<td></td>
<td>8118</td>
</tr>
<tr>
<td>3 Number of Education Administrators</td>
<td>387</td>
<td>309</td>
<td></td>
<td>696</td>
</tr>
</tbody>
</table>

### Data Collection Tools and Process

The data collection process was carried out according to the exploratory sequential pattern which is indicated in Figure 1. Two types of data were collected in the study. One is qualitative and the other is quantitative. The exploratory sequential pattern proposed by Creswell (2019, p. 6) for mixed-method research was used in data collection. Through document and report review, written and visual materials containing information on subjects aimed to be investigated have primarily been analysed and evaluated. Reports have been taken from MoNE PISA and OECD reports and websites of related institutions and organizations.

Considering the results acquired through the qualitative method applied in the initial phase, a questionnaire form was prepared to collect the teachers’ and administrators’ views and learn what they think about managing the education with local education boards (İslamoğlu, 2011). The survey questions were prepared by making use of the data obtained from the analysis of the education administration systems in OECD countries and the relevant literature. The concepts that make reference to the survey questions are given in Tables 2 and 3. The questionnaire consists of 16 questions and two sections; first section contains 7 questions about personal information and the second section contains 9 questions about preferences. A group consisting of 20 administrators and teachers were interviewed face to face on site, and the questionnaire has been revised according to their feedback. Thus, the content validity of the question items created for the survey has been tested and ensured. The survey questions consist of closed-ended multiple-choice questions that allow the teachers and administrators to mark more than one of the available answer options at the same time. In order to collect data, the survey has been sent electronically to the teachers and administrators in Seyhan district of Adana province via a link address (Google Survey), after obtaining the required legal permission.
Reliability

Both groups (group 1 and group 2) specified in table 1 have been subjected to the questionnaire separately. The results acquired via the questionnaire for each group have been tested for normality distribution. For test one, the skewness value has been measured as Skewness = (-0.996 – +0.216), and the kurtosis value has been measured as Kurtosis= (+0.516 – +0.428), while for test 2, skewness and kurtosis values have been measured as Skewness = (-1.00 – +0.216), and Kurtosis= (+0.730 – +0.428). In their study, Tabachnick & Fidel (2015) accept the values between (-1.50) and (+1.50) as the normal distribution of data, and again, George & Mallery (2010) assume the values between (-2.00) and (+2.00) as an indicator of the normal distribution of the data. Since the data are in a normal distribution, the Pearson Correlation test, which is one of the parametric tests, has been used for correlation analysis. In the correlation analysis conducted between Test 1 and test 2, the values in the test averages correspond to r=0.961 while the values in the test percentages are r= 0.960 and p<0.05. Cronbach’s alpha, which reflects the test score reliability and internal consistency, is equal to 0.978. This indicates that there is a high level of positive directional correlation between test retesting measurements. A significant relationship between the test-retest measurements of the scale items means that the stability, consistency, and reliability of the measurements are high (İslamoglu, 2011). At each stage of the study, the authors have made decisions together; they have debated and concluded what research method to be used for the study, where and how the data would be acquired, what data analysis methods to be used, how tables, figures, and forms to be formed, and how to compare and report the collected data. The authors have associated the results and data and saved the research data electronically for presentation upon request by other parties. Yıldırım and Şimşek (2013) assume that conducting a study through decision-making processes is a factor that increases the reliability of the study.

Validity

It has been supported by various reports to eliminate possible biases that may occur during the collection of qualitative data. The data were tabulated, and direct quotations from scientific studies were frequently included to demonstrate that the study presents data on what it claims to measure. This approach makes positive contributions to the validity of qualitative data (Yıldırım & Şimşek, 2013). When collecting quantitative data, it was observed that there was greater participation (421) than the predicted sample group (370). Data were collected electronically. Survey participants e-mailed their survey answers to the researcher via their personal computers or mobile phones. To ensure confidentiality, the data were collected directly in the researcher's mail, and the possibility of the second parties accessing the data was eliminated. Participants gave their answers with their own free will. The fact that the number of participants is higher than the predicted sample group and that the data are secured in a confidential environment clearly indicates that the internal and external validity of the research has been ensured.

Analysis of Data

Both the qualitative and quantitative data analysis process has been carried out according to the exploratory sequential pattern given in Figure 1. Within the scope of the exploratory sequential design, some tests such as test-retest, normality distribution, and correlation tests have been conducted to determine the reliability and validity of the data. Data concerning education administration systems implemented in 16 OECD countries have been acquired from various scientific studies. PISA test averages and GDP per capita of these countries were downloaded from the web page of the MoNE and OECD. The information added to the forms, the opinions of the teachers and administrators, the knowledge and experience of the authors who have academic and administrative experience, the "How to manage education" questionnaire was sent to the schools and applied to the teachers and administrators twice with the pretest-retest method. The questionnaire, which was prepared by taking into consideration the information added to the forms, the opinions of teachers and administrators, the knowledge and experiences of the authors who have academic and administrative experiences, was sent to schools, and applied twice to the teachers and administrators through test-retest method. Test-
retest was conducted for the validity and reliability of the questionnaire. The correlation between both tests has been examined. Reliability, normality distribution, and descriptive analyses have been conducted according to data acquired via test 2. Statistical Package for the Social Sciences (SPSS) 21 package program and Microsoft Excel office package program were used for the necessary statistical analysis of the collected data for the sub-problems of which answers were sought in the framework of the general purpose of the research. The data collected is a form of feedback and have been tabulated and ordered within itself through information processing. The data have been subjected to tests for validity, reliability, normality distribution, and Pearson correlation test, as well as descriptive statistics.

FINDINGS

Qualitative findings

In the qualitative analysis, the following findings were obtained. The findings include the board/commission forms they use in OECD country education management systems, Pisa exam and gross national product averages.

Table 2 Types of Educational Administration in Countries

<table>
<thead>
<tr>
<th>COUNTRY NAME</th>
<th>TYPE OF EDUCATIONAL ADMINISTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Central Education Board, National Education Reform Board, Lifelong Learning Board, Provincial and District Education Board (Bakioglu, 2014, p 249,250).</td>
</tr>
<tr>
<td>Canada</td>
<td>Council of Education Ministers, Canadian Education Association, Educational Studies Society, Teacher Federation, School Administrators Union, Teacher Council (Bakioglu, 2014, p 160,161).</td>
</tr>
<tr>
<td>Poland</td>
<td>Ministry of Education Advisory boards and Education District Boards, Higher Education Board and Central Exam Board and School Boards. (Balc, 2013, p. 483-498)</td>
</tr>
<tr>
<td>Germany</td>
<td>Council of Education Ministers, Federal State-State Commission, Teachers' Board, City, Regional and State Student Representative Boards, City, Regional and State Family Unions, (Bakioglu, 2014, p 278,279,280,281), School Boards (Gulcan, 2010, p 71)</td>
</tr>
<tr>
<td>Britain</td>
<td>Regional Action Forum, Local Education Board, School Board (Bakioglu, 2014, p 218,219,220)</td>
</tr>
<tr>
<td>USA</td>
<td>State Educational Board, Regional Educational Board (Balc, 2013, p.33)</td>
</tr>
<tr>
<td>Belgium</td>
<td>General Council, Advisory Committee, Education and Training Council, French Community Families Council, Flemish Education Council, School Council, Participation Council (Bakioglu, 2014, p 299,313,314)</td>
</tr>
<tr>
<td>Sweden</td>
<td>National Education Board (Gulcan 2010, p 158), Education Committees, Local Boards Consisting of Parents (Bakioglu, 2014, p 110,111,112)</td>
</tr>
<tr>
<td>Ireland</td>
<td>Education and Science Department Board, Program and Evaluation National Board, National Board of Education Decisions, School Board of Directors, Catholic Secondary Schools Administration Association and Board of Directors, Local Vocational Education Committees, (Bakioglu, 2014, p 126-127) National School Boards (Gulcan, 2010, p 144)</td>
</tr>
<tr>
<td>Swiss</td>
<td>School Commissions, School Boards (Balc, 2013, p.321, 329),</td>
</tr>
<tr>
<td>Denmark</td>
<td>Provncial Boards, School Boards, Education Council, Local Education Committees, Student - Staff Working Board, Vocational Education Board (Bakioglu, 2014, pp 91-92-93-94; Gulcan, 2010, p 111)</td>
</tr>
<tr>
<td>France</td>
<td>Elected Regional Councils, (Gulcan, 2010, p 133), National Programs for Education Programs, Various Education Committees, School Board, Continuous Committee Council, Class Council (Bakioglu, 2014, p 184,186)</td>
</tr>
<tr>
<td>Norway</td>
<td>Education is carried out under the auspices of the Ministry of Education and the Ministry of Art. Municipalities manage compulsory education jointly with relevant ministries. Vocational Education Council, Vocational Education Committees (Ada &amp;Baysal, 2015, p. 409-424)</td>
</tr>
</tbody>
</table>

In these countries, educational institutions are managed by local education boards (Table 2). These local boards are composed of members assigned by education stakeholders. Their educational administration structures are based on the principles of good governance, common sense, transparency, accountability, participation, democracy, effectiveness, efficiency, and sustainability.
This understanding has contributed to their educational and economic development, and the
democratic structure created has also propelled their countries towards a better democratic structure.
The boards/commissions that are frequently mentioned in the education management structures of
these countries and the Turkish education administration system are given in table 3.

Table 3 Country Reviews and Frequency Distribution of the Most Common Local Education
Boards and Board Members in the Literature

<table>
<thead>
<tr>
<th>Boards</th>
<th>f</th>
<th>Members on Boards</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Education Boards</td>
<td>16</td>
<td>Mayors</td>
<td>16</td>
</tr>
<tr>
<td>State Board of Education</td>
<td>16</td>
<td>Governor</td>
<td>9</td>
</tr>
<tr>
<td>Local/Regional/Provincial Education Boards</td>
<td>16</td>
<td>School principal</td>
<td>12</td>
</tr>
<tr>
<td>Higher Education Boards</td>
<td>16</td>
<td>Teachers</td>
<td>16</td>
</tr>
<tr>
<td>Vocational Education Boards</td>
<td>16</td>
<td>Non-Governmental Organizations</td>
<td>16</td>
</tr>
<tr>
<td>Education Supervisory Boards</td>
<td>14</td>
<td>Neighborhood Representatives</td>
<td>11</td>
</tr>
<tr>
<td>Exam Boards</td>
<td>4</td>
<td>Professional chambers</td>
<td>8</td>
</tr>
<tr>
<td>School Boards</td>
<td>16</td>
<td>Education Supervisors</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>University Representatives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Representatives</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Education Specialists</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student parents</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Law representatives</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financial Experts</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Regional Representatives</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Religious Representatives</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Industry and Trade Organizations</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business Representatives</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Culture, Sports and Art representatives</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relevant Ministry Representatives</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local Government representatives</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>University Representatives</td>
<td>10</td>
</tr>
</tbody>
</table>

According to the table, Central Education Boards, State Education Board, Local/Regional/Provincial Education Boards, Higher Education Boards and Vocational Education Boards are seen in the education administration systems of 16 countries, while Examination Boards are seen in only 4 countries. While Mayors, Teachers, Non-Governmental Organizations, Education Experts, Parents of Students and Local Government representatives take part in the boards of all 16 countries, Religious Representatives serve as representatives in 6 countries and Financial Experts and Professional Chambers in 8 countries. The Pisa exam and gross national product averages of the countries that prefer these boards are well above the OECD averages (Tablo 4).

Table 4 2018 PISA Test Average, GDP Per Capita In OECD Member Countries

<table>
<thead>
<tr>
<th>NAME OF COUNTRY</th>
<th>2018 PISA AVERAGE</th>
<th>2018 GROSS DOMESTIC PRODUCT $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MATHS</td>
<td>READING</td>
</tr>
<tr>
<td>Japan</td>
<td>527</td>
<td>504</td>
</tr>
<tr>
<td>Finland</td>
<td>507</td>
<td>520</td>
</tr>
<tr>
<td>Canada</td>
<td>512</td>
<td>520</td>
</tr>
<tr>
<td>Poland</td>
<td>516</td>
<td>512</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>519</td>
<td>485</td>
</tr>
<tr>
<td>Germany</td>
<td>500</td>
<td>498</td>
</tr>
<tr>
<td>Britain</td>
<td>502</td>
<td>504</td>
</tr>
<tr>
<td>USA</td>
<td>478</td>
<td>505</td>
</tr>
<tr>
<td>Belgium</td>
<td>508</td>
<td>493</td>
</tr>
<tr>
<td>Sweden</td>
<td>502</td>
<td>506</td>
</tr>
<tr>
<td>Ireland</td>
<td>500</td>
<td>518</td>
</tr>
<tr>
<td>Swiss</td>
<td>515</td>
<td>484</td>
</tr>
</tbody>
</table>
When the 2018 Pisa exam results and the OECD averages of gross domestic product are compared with the averages of Turkey, it is seen that Turkey is far behind and is well below the OECD averages. This situation can be said to be an indicator of the relationship between education and development.

How To Manage Education survey application findings

The survey was prepared by taking into account the Turkish education management system, the relevant literature and the education management structures of 16 OECD countries. The questionnaire, which was sent to the respective schools via e-mail, has been prepared by considering the literature, the Turkish education administration system and the education administration structures of OECD countries. Survey questions were prepared based on the most common concepts in the literature review and the examination of country education administration structures. The list of these concepts and their frequencies are given in Table 2 and Table 3. The concepts used in the survey but not included in this list are the concepts used in the field of educational administration in Turkey. These concepts are local and not the same in every country. These differences are included in the survey. Teachers and education administrators, who participated in the survey voluntarily, were asked to choose one or more options from the closed ended questions such as whether they agree with the idea of managing the educational institutions with local education boards, what kind of structural model should be development for such an educational administration, what people or institutions/organizations should be in the structures to be created. The following tables present the questions, the number of participants and the percentages corresponding to the respective options.

Table 5 Which Administration System Would You Like to Work with If Left to Your Preference?

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Administration</td>
<td>259</td>
<td>61.50</td>
</tr>
<tr>
<td>Central Administration</td>
<td>162</td>
<td>38.50</td>
</tr>
<tr>
<td>Total</td>
<td>421</td>
<td>100.00</td>
</tr>
</tbody>
</table>

A total of 421 teachers or administrators have participated in the survey. After answering the first question, those who chose the "Local Administration" option have been requested to continue to answer the other questions. It was left to the preferences of the others, who chose "Central Administration" option whether to continue or not. Eventually, 259 participants, who chose the "Local Administration" option, and those, who decided to continue to the survey, kept answering the questions. The data given in the following tables reflect the views of the participants that went on answering the questions.
Table 6 Which Of the Following Should Undertake the Localization Role of The Education Administration System?

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provincial Education Boards / Commissions</td>
<td>175</td>
<td>41%</td>
</tr>
<tr>
<td>Governorates</td>
<td>123</td>
<td>29%</td>
</tr>
<tr>
<td>Municipalities</td>
<td>72</td>
<td>17%</td>
</tr>
<tr>
<td>Others (Non-governmental organizations, etc.)</td>
<td>20</td>
<td>5%</td>
</tr>
<tr>
<td>Development Agencies</td>
<td>19</td>
<td>5%</td>
</tr>
<tr>
<td>Local Administrations</td>
<td>12</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>421</td>
<td>100%</td>
</tr>
</tbody>
</table>

41% of the teachers and administrators want the education administration system to be affiliated with the independent Provincial Education Boards / Commissions. That is, the majority of the participants prefer provincial education board/commission to undertake the role of decentralization of the education administration system.

Table 7 In Your Opinion, How Should Education Be Managed Locally?

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>With elected Boards / Commissions</td>
<td>257</td>
<td>61%</td>
</tr>
<tr>
<td>With Directorates (in the Current Form)</td>
<td>140</td>
<td>32%</td>
</tr>
<tr>
<td>Other</td>
<td>21</td>
<td>5%</td>
</tr>
<tr>
<td>With governorships</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>421</td>
<td>100%</td>
</tr>
</tbody>
</table>

61% of participants want the education system to be managed through elected boards/commissions. 32% of participants prefer the current centralized education administration system. The other percentages are not statistically significant.

Table 8 Who Should Be in the Provincial National Education Board / Commission? (You can choose more than one option)

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provincial Director of National Education</td>
<td>352</td>
<td>84%</td>
</tr>
<tr>
<td>Dean of the Faculty of Education</td>
<td>339</td>
<td>81%</td>
</tr>
<tr>
<td>A primary school teacher</td>
<td>328</td>
<td>78%</td>
</tr>
<tr>
<td>A primary school principal</td>
<td>326</td>
<td>77%</td>
</tr>
<tr>
<td>A secondary school principal</td>
<td>323</td>
<td>77%</td>
</tr>
<tr>
<td>A secondary school teacher</td>
<td>322</td>
<td>76%</td>
</tr>
<tr>
<td>A high school principal</td>
<td>320</td>
<td>76%</td>
</tr>
<tr>
<td>A high school teacher</td>
<td>319</td>
<td>76%</td>
</tr>
<tr>
<td>A kindergarten principal</td>
<td>311</td>
<td>74%</td>
</tr>
<tr>
<td>Three parents</td>
<td>309</td>
<td>73%</td>
</tr>
<tr>
<td>A kindergarten teacher</td>
<td>307</td>
<td>73%</td>
</tr>
<tr>
<td>A vocational high school principal</td>
<td>306</td>
<td>73%</td>
</tr>
<tr>
<td>Education Supervisors</td>
<td>305</td>
<td>72%</td>
</tr>
<tr>
<td>A vocational high school teacher</td>
<td>293</td>
<td>70%</td>
</tr>
<tr>
<td>Provincial Student Representative, Three students (Secondary school, Vocational school, High school)</td>
<td>290</td>
<td>69%</td>
</tr>
<tr>
<td>3 representatives from 3 unions with the most members</td>
<td>285</td>
<td>68%</td>
</tr>
<tr>
<td>Governor</td>
<td>253</td>
<td>60%</td>
</tr>
<tr>
<td>Representative of a selected educational association</td>
<td>242</td>
<td>57%</td>
</tr>
<tr>
<td>Rector</td>
<td>215</td>
<td>51%</td>
</tr>
<tr>
<td>Mayor</td>
<td>213</td>
<td>51%</td>
</tr>
<tr>
<td>A representative from the chambers of profession</td>
<td>211</td>
<td>50%</td>
</tr>
<tr>
<td>A representative of mukhtars/local authorities</td>
<td>170</td>
<td>40%</td>
</tr>
<tr>
<td>Director of local administrations</td>
<td>111</td>
<td>26%</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>0%</td>
</tr>
</tbody>
</table>

44
Considering 50 percentage and over as a statistically significant number, it can be said that a great majority of participants prefer a national education board/commission model, in which almost all education stakeholders apart from representatives of mukhtars and directors of local administrations are involved in.

Table 9 Who Should Take Part in National Education District Board/Commission? (You Can Choose More Than One Option)

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
</table>
| District Director of National Education          | 352 | 84%
| A primary school principal                      | 322 | 76%
| A secondary school teacher                      | 319 | 76%
| A high school teacher                           | 316 | 75%
| A high school principal                         | 315 | 75%
| A secondary school principal                    | 315 | 75%
| A kindergarten teacher                          | 314 | 75%
| A kindergarten principal                        | 313 | 74%
| A primary school teacher                        | 310 | 74%
| Three parents                                   | 297 | 71%
| A vocational high school principal              | 292 | 69%
| Faculty or college representative, if any        | 283 | 67%
| 3 representatives from 3 unions with the most members | 282 | 67%
| Education Supervisors / Education Inspectors    | 276 | 66%
| Provincial Student Representative Three students | 268 | 64%
| A vocational high school teacher                | 265 | 63%
| District governor                               | 243 | 58%
| Representative of a selected educational association | 227 | 54%
| Mayor                                           | 222 | 53%
| A representative from the professional chambers  | 168 | 40%
| Others                                          | 3   | 1% |

Considering the options with an acceptance ranging from 53% to 84% , it can be said that the majority of participants prefer a district education board/commission model, in which almost all education stakeholders, apart from the representative of the professional chambers and others, are involved in. That is, most of the participants prefer a participatory educational approach rather than a centralized educational approach.

Table 10 - Who should take part in the Vocational Secondary Education Board / Commission? (You can choose more than one option)

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
</table>
| Province / District Director of National Education                       | 294 | 70%
| A representative of the related faculty or school                        | 286 | 68%
| A vocational high school principal                                      | 271 | 64%
| A vocational high school teacher                                        | 269 | 64%
| A secondary school teacher                                              | 259 | 62%
| A secondary school principal                                            | 258 | 61%
| Public Education Administration                                         | 258 | 61%
| Provincial Student Representative, Three students (secondary school, vocational school, high school) | 257 | 61%
| A high school principal                                                 | 255 | 61%
| Chamber of Tradesmen Representative                                     | 254 | 60%
| Education Supervisors / Education Inspectors                            | 251 | 60%
| A high school teacher                                                   | 251 | 60%
| Three parents                                                           | 250 | 59%
| 3 representatives from 3 unions with the most members                   | 226 | 54%
| A representative from the professional chambers                          | 225 | 53%
| Small / Organized Industry representatives                               | 224 | 53%
| Representative of a selected educational association                    | 222 | 53%
| Governor / District Governor                                            | 215 | 51%
| Mayor                                                                   | 213 | 51%
| Public Institution Directorate Representatives                            | 186 | 44%
| Others                                                                  | 3   | 1%
| Chamber of Industry and Commerce Representatives                        | 0   | 0% |
Apart from the last three options, all of the other options have received more than 50 percent preference. Eventually, it is apparent that a great majority of the participants prefer a participatory board/commission model for secondary vocational education.

Table 11 Who Do You Think Should Be in The School / Board / Commission? (You Can Choose More Than One Option)

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Teachers</td>
<td>419</td>
<td>100%</td>
</tr>
<tr>
<td>Two Parents</td>
<td>364</td>
<td>86%</td>
</tr>
<tr>
<td>A student</td>
<td>318</td>
<td>76%</td>
</tr>
<tr>
<td>Union representatives</td>
<td>245</td>
<td>58%</td>
</tr>
<tr>
<td>Mukhtar</td>
<td>169</td>
<td>40%</td>
</tr>
<tr>
<td>Others (Please Write) ..........</td>
<td>2</td>
<td>0%</td>
</tr>
</tbody>
</table>

The options regarding those, who are directly involved in education like teachers and students or associated with education like parents and teachers’ unions, have received an acceptance ranging from 58% to 100%. This clearly shows that almost all participants consider that a school board/commission, in which teachers, students, parents, and a representative of the respective union take part, is essential.

Table 12 Who Do You Think Should Be in The Education Inspection and Evaluation Commissions? (You Can Choose More Than One Option)

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>366</td>
<td>87%</td>
</tr>
<tr>
<td>School Principals</td>
<td>357</td>
<td>85%</td>
</tr>
<tr>
<td>Education Supervisors / Education Inspectors</td>
<td>308</td>
<td>73%</td>
</tr>
<tr>
<td>Parent</td>
<td>270</td>
<td>64%</td>
</tr>
<tr>
<td>Board / Commission Representatives</td>
<td>222</td>
<td>53%</td>
</tr>
<tr>
<td>Union representatives</td>
<td>218</td>
<td>52%</td>
</tr>
<tr>
<td>Governor / District Governor</td>
<td>216</td>
<td>51%</td>
</tr>
<tr>
<td>Non-Governmental Organizations</td>
<td>210</td>
<td>50%</td>
</tr>
<tr>
<td>Mayors</td>
<td>209</td>
<td>50%</td>
</tr>
<tr>
<td>Chamber Representatives</td>
<td>139</td>
<td>33%</td>
</tr>
<tr>
<td>Mukhtar</td>
<td>111</td>
<td>26%</td>
</tr>
<tr>
<td>Others (Please write)</td>
<td>2</td>
<td>0%</td>
</tr>
</tbody>
</table>

Taking into account the preferences varying between 50% and 87%, it is apparent that the majority of participants prefer the participatory inspection and evaluation commissions in education. This clearly shows that almost all of the participants are well aware of the crucial role of inspection and evaluation in education.

Table 13 In Your Opinion, Which Duties Should the Central Government Hand Over to Local Education Units? (You Can Choose More Than One Option)

<table>
<thead>
<tr>
<th>Options</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance and repair of buildings and facilities</td>
<td>284</td>
<td>67%</td>
</tr>
<tr>
<td>Determining elective courses and their content</td>
<td>271</td>
<td>64%</td>
</tr>
<tr>
<td>Purchase of building hardware needs</td>
<td>266</td>
<td>63%</td>
</tr>
<tr>
<td>Meeting the needs for educational materials</td>
<td>266</td>
<td>63%</td>
</tr>
<tr>
<td>Professional education and training programs and their contents</td>
<td>250</td>
<td>59%</td>
</tr>
<tr>
<td>In-service training of the staff</td>
<td>231</td>
<td>55%</td>
</tr>
<tr>
<td>Construction and repair of buildings and facilities in the province</td>
<td>219</td>
<td>52%</td>
</tr>
<tr>
<td>Special Education and Guidance</td>
<td>213</td>
<td>51%</td>
</tr>
<tr>
<td>Income-expense planning</td>
<td>259</td>
<td>62%</td>
</tr>
<tr>
<td>Appointing school administrators</td>
<td>256</td>
<td>61%</td>
</tr>
<tr>
<td>Measurement and evaluation</td>
<td>247</td>
<td>59%</td>
</tr>
<tr>
<td>School opening and closing</td>
<td>243</td>
<td>58%</td>
</tr>
<tr>
<td>Preparing textbooks according to determined educational content</td>
<td>245</td>
<td>58%</td>
</tr>
<tr>
<td>Computing Board</td>
<td>239</td>
<td>57%</td>
</tr>
</tbody>
</table>
Determining the content of educational programs at all levels and types 236 56%
Distribution of personnel throughout the province (transfer etc.) 236 56%
Publishing textbooks according to determined educational content 232 55%
Education program policies at all levels and types 230 55%
Inspection and evaluation (financial, administrative, education and personnel) 230 55%
Personnel expenses (salary, treatment, assistance, additional pay, travelling allowance, etc.) 231 55%
Appointing provincial / district boards and administrators 226 54%
Staff vacant positions, and staff recruitment 222 53%
Identifying the general objectives and policies 151 36%
Determining the appropriate procedures and principles for the application of the laws 140 33%
Issuing regulations and guidelines 135 32%
Law Board 127 30%
Others 6 1%

Considering the views of the participants, whose choices correspond to 50% or over, we can say that a great majority of the participants consider that 22 duties out of 27 duties should be handed over to the local education units. On the other hand, it can be said that they want the Ministry of Education to carry out only some duties such as “identifying the general objectives and policies, "determining the appropriate procedures and principles for the application of the laws, "issuing regulations and guidelines”, etc.

DISCUSSION

Studies conducted on education administration lay it bare that participation of stakeholders in education administration has a crucial role in developing a sense of belonging, diversity, and development. In line with this, the teachers and administrators, who participated in this study voluntarily, preferred educational administration that is based on both decentralization and diversity. This can be expressed as a desire of reflecting their culture and identity to education, taking responsibility, and improving education.

Education develops by building on qualified experiences (Dewey, 2014). Every experience is in line with the possibilities of the environment that we live in. Local possibilities create the experience. For this reason, adopting an education system with participatory local dynamics will facilitate the acquisition of the desired qualifications in education. As stated by Gobby and Niesche (2019), good governance in education administration should be carried out through horizontal and non-state relations, stakeholders and common network governance, and local mechanisms such as governing bodies, boards, and councils. Education boards are structures where many different experiences and points of view are combined and discussed. It contains all the experiences of the local. Therefore, education administration should be strengthened by enacting regulations enabling local boards/commissions to take active roles in managing education. Table 5 clearly demonstrates that the majority of the teachers and administrators that participated in the survey prefer local education administration model rather than centralized education administration model. The overall results acquired through the survey clearly indicate that the sample group prefers a participatory education model in which the education administration is grounded on boards/commissions education model.

To achieve the good governance principles, sustainability, productivity, and quality as well as efficiency in education, it is essential to switch to local education boards model in Turkey. This model allows the participation of education stakeholders to involve in decision making and managing processes. To this end, educational boards need to encompass the respective stakeholders such as school principals, teachers, students, parents, and local administrators, representatives of universities, educational unions, non-governmental organizations, and local administrative bodies. In addition to the local education boards, various sub-boards or commissions need to establish to increase participation as well as to distribute the duties in competent hands. People need to learn the difference between working under the strict control of a single authority and working in an environment where contrasting demands and ideas are available to discuss (Hammer & Stanton, 1998). This can be achieved in a system that adopts good governance. Tables 8, 9, 10, 11 and 12 clearly demonstrate that
the teachers and administrators that participated in the survey prefer a diverse participatory education board/commission model in managing education.

Considering table 8, 9, 11, 12, 13 that provide information about the choices of the teachers and administrators participated in the survey, it is apparent that they prefer individuals from different institutions, organizations, local facilities, and non-governmental organizations to take active roles in the boards of education. This is a solid indicator that they are aware of the crucial role of board diversity in ensuring participation, accountability, transparency, reliability, effectiveness, and efficiency in education. In their studies, Pechersky (2016), Gobby and Niesche (2019), García-Sánchez et al. (2015) state that board diversity, which relies on participatory effective governance, provides contribution to make healthier decisions. Here, it is obvious that the choices made by the teachers and administrators coincide with the scientific studies conducted in the field.

The number of board members of the education units preferred by teachers and administrators varies between 5 and 20. Considering the requirements, this number can be lowered to ideal numbers without compromising diversity. According to the study conducted by Fernández-Fernández (1999), the ideal number of members of a board of directors needs to be between 5 and 15. According to Pechersky (2016), Bozec (2005), Chen et al. (2011), and Bayramoğlu (2005), the presence of external members in the board of directors strengthens the connection of the boards with the external sectors, and can provide significant contributions to make appropriate and consensus-oriented decisions by approaching the events from different perspectives. As seen in the table 8, 9, 12,13 representatives of external institutions, associations, and organizations are included in the list of options along with the educational stakeholders. The choices of the sample group that consists of teachers and school administrators clearly point to a participatory education board model consisting of both educational stakeholders and external members.

In their studies, Pechersky (2016), García-Sánchez et al., (2015), Anderson et al., (2007), Drymiotes (2008), Fernández-Fernández (1999), Bozec (2005), Chen et al., (2011), Gobby and Niesche (2019) highlight that the monitoring and control function of the boards is an important issue in maintaining solid financial tables and protecting the interests of the corporate, institute and organizations. In all countries listed in the Table 4, education boards and monitoring and audit commissions composed of independent members are the leading gears of the education administration to ensure good governance. Table 8, 9,10 clearly shows that a significant number of the sample group consisting of teachers and school administrators prefer education inspectors/auditors to take part in the education boards due to their knowledge and experience in monitoring and auditing. Table 12 shows that a great number of the sample group also prefers the establishment of the inspection and evaluation commissions composed of independent individuals. Eventually, the preferences of the teachers and administrators participated in the survey voluntarily clearly demonstrate that they are aware of the necessity of managing education through educational boards along with commissions with monitoring and control function.

Development is closely associated with education; this relation significantly contributes to social peace, the development of civilization and the maintenance of the sustainable economy (Altaşışk & Peker, 2012). These contributions are the outcomes of long-term investments, in this regard; it is one of the investment areas with the highest return (Gümüş & Şişman, 2014). Adopting education administration models based on good governance has propelled investments in the field of education. These investments in education have played a key role in achieving the desired success and welfare in all OECD member countries that embraced the participatory board model in managing education. This education model has paved the way for these countries to achieve results over OECD averages in both PISA test and in gross domestic product per capita (Table 2 and 4). PISA test results act as an indicator reflecting not only academic success but also economic and democratic development as well. Therefore, Turkey needs to provide her young population with better educational opportunities than ever before to overcome the status of being a middle-income country and achieve the level of social welfare targeted (Şirin & Vatanarturan, 2014). To achieve this, it is essential to go over the current education administration system based on data and come up with sounding reforms in
the light of these data (Şirin & Vatanarturan). As the first reform as stated by Chen et al., (2011), the corporate governance principles of the OECD should be adopted. As seen in table 6 and 7, the teachers and administrators participating in the survey prefer an education administration model that complies with the good governance principles. The data acquired through the research show that the local education boards’ model is adopted by the education stakeholders, and they have adequate awareness regarding the issue.

Highlighting the importance of participatory education in ensuring efficiency and raising individuals, who are well equipped with knowledge and skills required to address the needs of the era, in his study, Şahin (2003) states that a fundamental system change is required to achieve this. He also underlines that switching from centralized education system to decentralization in education is one of the steps to be taken primarily. In his study, Şimşek (1997) states that Turkish National Education system, which is strict and based on a centralized, bureaucratic, and hierarchical structure, has turned into a gigantic organism that lost its ability to think and act. In this sense, Şahin (2003) emphasizes that the structure and functioning of the National Education System, which is centralized and falls short to respond to the needs of the society, should be changed. Underlining the negative impacts of vertical organization of the central authority and excessive bureaucratic work and transactions on the subordinates and staff, Onural (2005) draws attention to the need of solid changes in the organizational structure to eliminate the negative impacts. It is apparent that the Turkish National Education System needs radical changes to get rid of the negative outcomes of the current system and keep up with the requirements of the era. Based on the results acquired through the mixed method, this study presents an alternative education model to make up the deficiencies in the current Turkish Education System and ensure accountability, reliability, sustainability, effectiveness, and efficiency. This study offers horizontal organization instead of vertical (top-down) organization, decentralization instead of centralization, participatory education model instead of education based on a single authority. The majority of the teachers and administrators, who participated in the survey voluntarily, have highly preferred the model that responds to these needs (Table 5, 6,7).

CONCLUSION

Switching to a model where education administration is based on boards/commissions will contribute to societies to feel stronger, to accumulate their experiences, to develop a sense of being responsible of the outcomes of the decisions taken, to add plus to the economy locally, and to take responsibility in the development of the country.

Education is such an important phenomenon that it cannot be managed with top-down decisions taken alone by a minister, general manager, governor, provincial director of national education or school principal. The right and conscious upbringing of future generations is not possible with the decisions made by single authority. This is a structural problem and structural problems cannot be solved by changing the name (like saying school leader instead of school director...). It is time to address structural problems rather than technical problems to solve the problems related to the education system. It has become a necessity to have a more modern, democratic, and participatory structural model in the education administration system. Managing educational institutions with Local Education Boards will solve structural problems.

Current Turkish education system is highly strict and centralized. Education administration grounds on the decisions of directorates, of which directors are appointed with top-down decisions. This governing approach that based on managing education with the decisions taken by a single authority should be abandoned immediately. The education administration system should be localized. Localization is the expansion of democracy to society. Localized democracy appears as an empirical, sociological, and epistemological concept rather than a political one, glorifying individual and social freedom (Bakır, 2014). Managing educational institutions with systems based on more democratic structures and the localization of the education administration system will contribute to the democracy understanding of all segments of the society as well. Localization in education administration will
also play a key role in the internalization of democracy by unveiling the close relationship between democracy and education.

Instead of the current Turkish education administration system that based on the directorates, Local Education Boards model should be formed to achieve the desired goals, good governance, accountability, transparency, sustainable development, and social welfare. Local Education Boards can encompass various councils and commissions such as Provincial Education Council, Provincial/District Educational Counselling and Inspection Board, School Board of Directors, School Teachers Board, District Education Board, etc. Decisions should be made based on majority voting or unanimity. Decisions taken in schools should be in line with the decisions of the Provincial Board of Education. The Ministry should hand over all its implementation duties and responsibilities to the local education boards. It should only be in a position to set top policy, to monitor, evaluate and audit.

In almost all countries of which per capita GNP is higher than the OECD average, the education administration system consists of boards and commissions (Table 2). All countries of which education systems managed by boards / commissions have scored higher than OECD averages in PISA exams. The quality of education and its contribution to the economy is quite high. Such a restructuring in educational administration is inevitable for Turkey. A pluralistic decision-making mechanism instead of a single decision-maker will boost the quality of education and the added value of education.

Grounding on all the findings and results acquired through this study, the Local Education Boards model has been developed and proposed as an alternative for the Turkish education administration system (Figure 2-3).

RECOMMENDATIONS

1. Under the light of findings and results obtained through this study, and within the frame of the objectives of this study, a Local Education Boards model has been designed as Local Organization and Central Organization and proposed as an alternative to the Turkish Education Administration System (Figure 2 and 3).

2. It is recommended to carry out pilot scheme(s) to test and evaluate the feasibility of the proposed educational model in any province (or provinces) under the supervision of field experts within the body of the current education system. Grounding on the data acquired while evaluating education administration system in OECD member countries, it can be said that such pilot studies help identify the short comings of the model, if any. In case of any deficiencies, necessary steps are taken to make up the shortcomings of the model, and pilot studies are kept ongoing after making up the deficiencies of the model.

3. In the future, the authors can conduct qualitative, quantitative, or mixed method studies on the structure of local education boards, their internal functioning, the way that the boards are formed and the structures of sub-boards.

4. This study also constitutes ground for alternative solutions for policy makers, who consider innovative movements in Turkish education administration system. We recommend them to consider the local education boards model within their innovative movement as an alternative.

Recommended Model

Local Education Board Model

The number of people who will take part in all boards/commissions may vary. Considering the needs and characteristics of the region, the members of the board/commission can be increased or
decreased. In addition, different members can be added to the board/commissions, considering local diversity. Also, the variety of tasks can be developed again in accordance with the needs of the region and the era. This is a draft local government plan and can be further developed with the help of various scientific studies.

Central Organization:

National Education Supreme Council: The Supreme Council of National Education will be the board that determines the education policies of the country. It implements participatory, transparent, fair, development-oriented, and scientific principles-based policies with all education stakeholders. Prepares 5-year plans and annual action plans. The Board will be the decision maker in line with the demands and objectives of each ministry, considering all requests in line with government programs and development plans. The draft texts of the plans related to education are created by this board and they decide and approve the final form of the plans to be prepared. They get together for meeting in every 2 years. When deemed necessary, it can also meet at different time intervals at the request of the minister or at the request of half of the board members. One more than half (½ +1) of the members present at the meeting is considered valid for the decision making.

Central Organization of the Ministry of National Education: It is the implementing unit of the Supreme Council of National Education. The central organization operates in areas such as monitoring, evaluation, supervision, determining national education policies, investment policies, preparing general and regional budgets, national teacher education, and higher education general policies. Provides financial and technical support to provincial/regional education policies. It consists of a board of ministers and 6 deputy ministers in the organizational structure. Sub-units are formed for each deputy minister who is in charge. Deputy ministers are given duties and powers within the framework of the legislation in parallel with the provincial education boards/commissions. The units for which the deputy ministers are responsible operate in areas such as policy making, monitoring, evaluation, and supervision. In the organization, the Supervision and Evaluation Board is formed which is directly connected to the minister. Audits are made on behalf of the ministry.

Higher Education Council: It is a slightly renovated version of the existing building. It is an autonomous institution directly subordinate to the ministry. It consists of a board/commission composed of university representatives. It is the determining body of higher education policies. The established board determines its bylaws and operation. Universities form their administrative boards and elect their rectors. It carries out higher education policy and educational activities within the plans and policies determined by the Supreme Council of National Education. It makes its administrative structure within itself, with boards and commissions. The diversity of the committees to be formed at the university is given importance, and it creates and implements decisions in scientific, artistic, professional, and social areas. The committees are based on the representation of students, academics, administrative staff, and public members.

Local Organization

Provincial/District National Education Board/Commission: The Board/Commission determines the provincial/district education policies. It implements participatory, transparent, fair, development-oriented, and scientific principles-based policies with all education stakeholders. The Board shapes the provincial/district education plans in line with the national education policies of the Ministry of National Education. It prepares the general education policies of the province/district, considering local needs, within the framework of the plans prepared by the Ministry. It organizes the selection of provincial/district Education directors. In the organization, the Supervision and Evaluation Board is formed directly reporting to the Governor/District Governor/Mayor. Training supervisors who are experts in their fields are appointed in the implementation unit in the Board. It carries out the supervision and evaluation of School Boards, Vocational Education Boards and Provincial/District National Education Organizations on behalf of the Governor/District Governor/Mayor. It also guides educational activities.
University: It is an autonomous institution in the province. It acts in line with the policies of the Presidency of the Council of Higher Education in its internal policies. It forms its own board of directors. University employees elect the rector.

Provincial/District National Education Organization: It is the implementing unit of the Provincial/District National Education Board, Vocational Education Board and School boards. Provincial and district education directors and branch principals elect school principals. 6 branch managers are selected. However, this number can be increased according to the population of the province/district. The number of branch managers is at least six.

Duties of this board:

Determining elective courses and their contents, purchasing building equipment needs, meeting the needs of educational materials, vocational education and training programs and their contents, in-service training of personnel, construction and repair of buildings and facilities in the province (planning and budgeting), special education and guidance, income-expenditure planning, planning, measuring and evaluating school institution manager elections, opening and closing schools, preparing or selecting textbooks according to the determined educational content, data processing board, determining the content of education programs of all levels and types, distribution of personnel throughout the province (transfer, etc.), publishing textbooks according to the determined educational content, policies of all levels and types of education programs, inspection and evaluation (financial, administrative, education-training and personnel supervision), personnel expenses (salary, treatment, assistance, additional payment, travel, etc.). Planning the appointment of provincial/district boards and administrators, creating and recruiting personnel will be in the form. In addition, an independent supervisory board will be established in the province and this board will carry out supervision and guidance activities. The supervisory board will report directly to the governor or mayor.

Vocational Education Board: It continues its activities in line with the policies of the National Education Supreme Council and the Provincial/District Board of Education. It gets together with a meeting in every 2 years and carries out vocational education policies, considering the needs of the region. The university works in collaboration with local industry and commerce.

School Boards: School boards are directly affiliated with the Provincial/District Education Organization. Selects the school administration. It plans and enforces the education policies of the school, the textbooks to be taught at the school, the weekly course schedules, the ceremonies to be held at the schools, and the social and sportive activities. It determines the school's budget and carries out the year-end audit of the budget. It can make a request to the supervisory board for the supervision of education and training activities.
Figure 2 Local Organization

Figure 3 Central Organization
Limitations

This study is limited to the use of mixed-method, exploratory sequential design, and general scanning model. The quantitative part of the study is limited to random systematic sampling consisting of 8450 teachers and 387 administrators working in the Seyhan district of Adana province in the spring term of the Academic Year of 2016-2017. In different years, there were no opportunities to work with more administrators and teachers. For qualitative data, the population has been limited to 36 OECD countries, and among these countries, the sample has been limited to Turkey and 15 countries, of which per capita GDP and PISA exam averages were above the OECD average, and the purposeful sampling has been used. The fact that this study includes only GDP and PISA exam results of 16 countries out of 36 OECD member countries is accepted as a qualitative limitation of the study.

The local education boards model that developed within the scope of this study is limited to the general structure. This article was produced in the doctoral thesis of PhD Suphi Turhan.

REFERENCES


Thai University Students’ Perceptions of Online Education after Extended Period of Emergency Remote Education

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Abstract

For over 2 years, the Covid-19 pandemic forced large numbers of Thai students to engage in emergency remote education, but with the pandemic abating and students returning to face-to-face classrooms, this paper takes the opportunity to examine students’ feelings about their experience with online education. The aims of this research are thus to investigate students’ perceptions of their university’s preparedness and its provision of ongoing support for online learning, the quality of the online teaching, the advantages and disadvantages of online classrooms, the students’ technological self-efficacy, and their preferred mode of learning when the pandemic abates. The results reveal that students’ overall satisfaction with the university’s preparedness and support was at the moderate level, while the quality of online teaching and students’ technological self-efficacy were rated at the high level. In terms of the advantages and disadvantages of online education, the latter outweighed the former. The students’ preferred mode of learning after the end of the pandemic was face-to-face classrooms, followed in order by blended learning, and then fully online classrooms. The findings suggest that factors including the lack of university life experiences, an absence of classroom interaction, health problems, and heavy workloads could hinder the adoption of fully online classrooms.

Keywords: Emergency Remote Education, Perception, Information Technology

DOI: 10.29329/ijpe.2022.467.4

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INTRODUCTION

When Covid-19 was first confirmed in December 2019, no one could have anticipated its impact, and for over 2 years, the spread of the disease has sustained a global public health crisis. The pandemic not only brought economic activity to a halt around the world, it also left governments with no option but to impose national lockdowns, enforce social distancing measures and in some cases, implement curfews as they struggled to slow the spread of the disease. This had an immediate effect on the public and private sectors as they tried to adjust to this new reality. In Thailand, the government declared a state of emergency on 26 March, 2020, and following this, a partial lockdown was announced with restrictions on movement, nighttime curfews, and the enforcement of state quarantines. In the education sector, the announcement of a national lockdown led to school closures, delayed reopenings, reduced class sizes and most importantly, a transition to remote learning that meant that schools and universities then pushed teachers and students to teach and study online. In Thailand, the outbreak coincided with the summer holiday and so schools and universities were lucky in that they had 2-3 months to prepare their ICT infrastructure, test their systems and train teachers and staff on how to transition from face-to-face to online or virtual education.

The initial experience with online learning in Thai schools and universities was not an unmitigated success and during the first wave of Covid-19 in July 2020, a national outcry ensued over the accessibility and quality of online learning. It was found that many students were not able to use online facilities due to a lack of access to technology which not only resulted in a loss of learning opportunities, but also highlighted the deeper digital divide that separates schools in cities and in rural areas (Oxford Policy Management, 2020). In addition, while the strength of online education lies in its flexibility which allows students to access lessons at their own time and pace, online classes in Thailand tend to replicate lecture-based classrooms that require students to sit through scheduled lessons all day, increasing screen time for students and limiting their movement. Because students have been engaged in online classes, classroom interactions and activities between teachers and classmates have been dramatically reduced, and this may have increased students’ anxiety, while undermining their motivation and performance. A study by Jiang, Yan-Li, Pamanee and Sriyanto (2021) which examined the level of depressions, anxiety and stress during the pandemic revealed that of all 385 Thai university students in the study, 33.2% of students were under stress, 47% suffered from anxiety, and 46.2% from depression.

It should be noted that while the transition to online education in Mid-2020 was both unprecedented and took place in a remarkably short period of time, the move was expected to be only short-term as the Thai government was at that time successful in controlling the number of new infections. Thus, at the start of the second semester in October 2020, many schools and universities resumed onsite learning with precautions in place to guard against the spread of Covid-19, these including temperature checks, enforced mask-wearing, reduced class sizes, and the installation of makeshift cubicles in classrooms. However, a resurgence in Covid-19 infections forced many schools and universities to move back to distance learning in early January 2021. The return to online learning prompted concerns that this disruption would have long-term impacts on students’ learning and development and, at the same time, the reintroduction of online education meant that schools and universities would have to address the learning deficits caused by this. The situation worsened later in 2021, when in April, the country faced the Delta-powered third and most severe wave of infection and then a fourth wave in mid-August. During this period, the government’s policy on school closures, in-person learning and online classes varied in its degree of enforcement. Thus, during the first and second wave of the pandemic, the government encouraged a switch to online classes to minimize the spread of the disease, but once 85% of teachers and students had been vaccinated, the government allowed schools and universities to decide for themselves if they wished to switch to onsite teaching, stay with online learning, or adopt a combination of both.

From the first wave of Covid-19 in 2020 to the fourth wave in 2021 and continuing into 2022, Thai students have spent over 20 months having their learning disrupted by school rescheduling and the flipping between online and in-person learning. At the same time, teachers have been tasked with
giving academic and emotional support to their students as well as providing distance learning for all during full and partial school closures, and whether they wanted to or not, both teachers and students have been fully immersed in an online learning environment for nearly two years. At the same time, we have seen a clear rise in the number of schools and universities offering online education, either ‘blended’ or completely online, and changes in the perception of online learning may persist through the post-pandemic period.

Against this backdrop and because students are the most important stakeholders in the education system, this research attempts to investigate university students’ attitudes towards online learning during the Covid-19 pandemic. The participants comprised first-, second- and third-year English major students enrolled at a provincial university in Thailand.

**Purpose of the Present Study**

The study aims to examine three aspects of students’ attitudes toward online learning:

1. At the institutional level, the study aims to investigate students’ views regarding the university’s preparedness and provision of ongoing support for online-learning during the Covid-19 pandemic;

2. At the classroom level, the study aims to reveal the characteristics of online classrooms and the quality of teaching provided via online lessons; and

3. At the personal level, the study aims to explore students’ attitudes towards online classrooms in comparison with face-to-face tuition, students’ self-efficacy in terms of technology, and their preferred mode of learning when the pandemic abates.

The study rests on the assumption that at the onset of the Covid-19 pandemic, when students were robbed of their familiar face-to-face classrooms with all their tables and desks, classmates and teachers, textbooks and worksheets, and the routines that come with this, they might initially feel anxious and skeptical but over time, as they gained momentum, learnt how to use the new technology, and overcame the learning barriers, students’ attitudes towards online learning might have become more positive. However, if after over two years, students’ responses showed that the prolonged use of online lessons was burdensome and had led to higher levels of exhaustion and anxiety, interventions might be needed to create a more favorable learning environment.

**Literature review**

Prior to the outbreak of Covid-19, the adoption of online learning and information communication technology (ICT) was moving forward within Thai educational institutions, albeit only slowly and sporadically, but the pandemic acted as both a catalyst for a sudden shift in education and a test of the effectiveness of online education. Because education plays a pivotal role in producing a high-quality workforce, the Thai education system has the lead role in fostering student creativity and in building community networks that facilitate learning for innovation through partnerships and the use of technology. According to Ngampornchai and Adams (2016), e-learning and information communication technology has become an important part of the national effort to improve public education, as well as acting as a pathway to education for students who are unable to access higher education directly. In addition, several studies show that the general attitudes of Thai students towards the use of ICT in classroom and online education are reasonably positive.

A study by Bhatiasevi (2011) found that Thai students expressed a willingness to use e-learning systems and showed satisfaction towards e-learning materials, while a study by Teo et al. (2011) that explored students’ attitudes towards e-learning at three public universities in Thailand found that participants had an above-average level of acceptance. Olivier (2017) reported in his study of Thai students’ attitudes toward learning English through e-learning that approximately 60% of his...
research participants have a positive attitude towards this, while a study by Chomphuchart (2017) regarding Thai university students’ attitudes on the use of the internet to learn English revealed that the majority of the participants supported this. It should be noted here that these studies were carried out before the Covid-19 pandemic and reported on exploratory attempts at blended learning approaches that integrated ICT technology and the internet as part of normal lessons, rather than the complete adoption of online learning, as happened during the pandemic. Indeed, according to Todd (2020), the suddenness of the shift to online learning meant that the relevance of previous research investigating moves to online learning was unclear, given that the shift was coerced and unplanned. In light of this, conducting research into the impact of the switch to emergency remote education during the pandemic remains both important and relevant.

Under normal circumstances, developing online education requires that considerable time and resources be put into planning, designing, and making available and accessible the correct learning tools. Students and instructors also need to be guided through these kinds of open educational practices (Bozkurt, 2019a, 2019b), but under the pressure of the Covid-19 crisis, none of this was possible. To better understand the sudden changes in teaching and learning during the crisis, Bozkurt et al. (2020) use the term ‘emergency remote education’ (ERE) to differentiate between the transformation in educational practices made during the Covid-19 pandemic and more regular distance education. This is necessary because while distance education is used as a generic term for remote, online or e-learning, these terms do not capture what has happened during the period of the pandemic.

For educational institutions, it is important to be clear whether the provision of emergency remote education or of online education is their primary objective, since the instructional design and preparation time required for each is very different. and falsely assuming that the two are the same can lead to the development of bad practices. Hodges et al. (2020) therefore state that the primary objective of emergency remote education is “not to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis” (Hodges et al., 2020, Emergency remote teaching section). Once the pandemic abates, it is hoped that schools and colleges will be able to return to regular teaching and learning.

Shortly after the implementation of emergency remote education, researchers worldwide conducted studies to identify the impact of the changing educational landscape on teachers’ and students’ attitudes. Perhaps not surprisingly, the results differed depending on the institutional context. Doolan et al. (2021) conducted a survey with students studying in Europe in 2020 on their life during the Covid-19 lockdown. The survey covered several topics affecting student life, including academic responsibilities, support networks, emotional well-being, skills and infrastructure required for working from home, life circumstances, and students’ adjustment to the lockdown. In terms of academic life, the findings showed that although the majority of students were satisfied with how supportive lecturers and their performance had worsened since on-site classes were cancelled, reflecting their perceived drop in performance. Also in 2020, Aristovnik et al. (2020) conducted a large-scale study of how students perceived the impacts of the first wave of Covid-19. This revealed that while students were satisfied with the support provided by teaching staff and their university, a lack of computer skills, the higher workload, and problems with focusing during online classes all meant that they felt that their academic performance had not improved in the new teaching environment. The study also revealed the disparity between universities in the developed economies and those in the developing world, where problems related to unpreparedness for emergency remote education and technical infrastructure tend to be significantly more serious, and this then affected students’ attitudes.

During Thailand’s first wave of Covid-19 in July 2020, it became clear that the transition to online classes was going to be problematic as Thai education system was not prepared to deal with a crisis of this scale. According to Lao (2020), not only were existing online resources for students limited in quality and quantity, but the inability of teachers to incorporate technology into their lesson increased the likelihood that their online lessons would be static and ineffective. Problems with
infrastructure were also substantial since many smaller Thai schools face a severe shortage of basic resources, such as computers, internet access, and IT support. A report by Kenan Foundation Asia (2020) highlighted three consequences of the Covid-19 pandemic on Thai education including educational inequality, ineffective teaching practices and the lack of support for teachers and students. In addition, the sudden shift to online learning without a clear direction or sufficient guidelines left teachers and students feeling confused, alienated and powerless. Thus, the Covid-19 pandemic changed how teachers deliver lessons, interact with students, and assess student learning, while students were suddenly faced with a virtual classroom within which they needed to learn a new way of studying and interacting with their teachers and classmates.

Several studies have been carried out regarding Thai tertiary students’ attitudes towards emergency remote education during the first and second wave of the pandemic. Imsa-ard (2020) conducted a study on Thai university students’ perceptions of the abrupt transition to online learning during the initial outbreak of Covid-19 and found that after 7 weeks of online education, the majority of students did not think that online learning enhanced the quality of teaching; the instructors could not organise online lessons efficiently; and students preferred face-to-face classrooms to online learning. Another study by Phalitonkiat et al. (2020) of Thai students’ readiness for online learning during the pandemic showed that poor internet connectivity and fewer interactions between teachers and students in online classes may lead to a drop in motivation, while a study by Sukman and Mhunkongdee (2021) revealed that while students accepted that online education was an appropriate course of action during the pandemic, they still preferred face-to-face classrooms. Siriteerawasa (2021) conducted research on the obstacles to online learning faced by Thai university students during the Covid-19 crisis. This identified five major themes: technology, learning and instruction, communication, finance, health, and well-being. Although these studies highlight the challenges of online learning, later studies showed that Thai students had more positive attitudes towards emergency remote education. Nuankaew et al. (2021) conducted research to study students’ attitudes and perspectives on online learning at four Thai universities and found that respondents showed a high level of satisfaction towards this. Thanavisuth (2021) looked at the level of acceptance of online classes and discovered that the majority of students found that these were at least somewhat enjoyable. These studies highlight students’ positive and negative attitudes towards the transition to emergency remote education, while also showing the gradual change in students’ attitudes over the course of the pandemic in 2020 and 2021. As mentioned earlier, the research assumption here is that during the first wave of Covid-19, the abrupt transition to emergency remote education left many students feeling anxious, but once online learning had established itself as part of students’ academic life, students then developed a new set of perspectives that led to a change in attitudes. This was indeed found by Unger and Meiran (2020), who showed that students felt less anxious three weeks after the change in their learning system as they gradually become accustomed to online education. Lobos et al. (2022) also examined the expectations and experiences of university students regarding online education through two terms starting in March and September 2020 and found that there were changes in students’ attitudes. These were generally negative in March 2020, but they changed to feeling more positive towards online teaching and learning, online assessment, and their self-efficacy by the end of the academic period in September.

The results of these studies reveal that the shift to emergency remote education was a mixed blessing, and while some viewed this as disruptive, others saw it as a new opportunity. The present study therefore focuses on how students at one provincial university responded to the move to emergency remote education. In particular, it looks at students’ perceptions of and experiences with emergency remote education, the characteristics of online classrooms, and their technology self-efficacy, as well as investigating how online and face-to-face classrooms compare.
RESEARCH METHOD

Research Framework

Because the transition to emergency remote education requires that the entire institution adapts and adjusts, this research focuses on students’ attitudes towards online learning at three levels: the institutional, the classroom, and the personal. Students’ attitudes are often regarded as one of the key factors explaining students’ learning performance, and because these can change and develop with time, students’ attitudes may be linked to their tendency to respond towards learning on a continuum of positive to negative. In addition, because these attitudes can be formed through learning environments and social experiences with others, this research follows the framework laid out by Martin, Budhrani, and Wang (2019). This states that faculty readiness to teach online encompasses the readiness of the university to provide the learning environment and facilities required for online education and the readiness of teachers to deliver classes online. Faculty readiness may be assessed through students’ experiences of the university’s improved infrastructure, the availability of orientations and on-going training, as well as the provision of technical support by the university, while teachers’ readiness may be assessed through students’ beliefs regarding the quality of online teaching and an evaluation of the characteristics of this. (Martin, Budhrani, & Wang, 2019).

On the personal level, students’ attitudes are formed through various factors including personal traits, self-perceptions, competencies, and interactions with others. Studies on students’ attitudes towards online learning have shown that students’ technology and internet self-efficacy has an impact on their attitudes, and so this study looks at this with regard to students’ use of online learning tools. The study also asked students to compare and contrast their experiences in face-to-face and classrooms, as each type of teaching demonstrates particular aspects that can influence students’ attitudes.

Research Participants and Methods

The participants in the study were selected in a non-probabilistic way using convenience sampling and comprised first to third year English majors at a provincial university in the northern region of Thailand. Each of these three years varied in terms of their exposure to online education, and so the third-year students had studied in traditional classrooms in their first year and the first half of the second year. The second-year students had also begun their university life with in-person classes, but the first-year students had not yet experienced face-to-face classrooms at the tertiary level. Students were informed about the purposes of the study, and student confidentiality and other ethical issues prior to the data collection, which was carried out using an open-ended questionnaire. Participation in the research was voluntary. The relevant committee of the English department was informed about the study and approved its procedures.

Due to the Covid-19 restrictions, an online questionnaire was utilized that was distributed via Google Forms. The questionnaires were sent to students in February, 2022, three weeks before end of the second term of the 2021 academic year. Access to the online questionnaire was open for three weeks. The questionnaire was divided into seven parts, with all items relating to research questions. The first part contained demographic questions that asked about gender, years of study, grade point average, prior experience with online education, and types of online education experienced during the pandemic. The second part asked about the level of preparedness and ongoing support provided by the university to the students. The third section measured students’ computer and internet self-efficacy, and the fourth asked about the characteristics of students’ online classrooms. The fifth section concerned students’ opinions of the quality of teaching in online classes, the sixth asked for students’ opinions on online education as opposed to traditional classrooms, and the final part asked students to choose their preferred mode of learning once the pandemic had abated. A five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) was used to collect data from the 2nd, 3rd, 5th, and 6th parts of the questionnaire. Multiple choice and checkbox questions were used to collect data from the 1st, 4th and final parts of the questionnaire. Each section also contained
open questions for students to add additional comments or suggestions as desired. Descriptive statistics including mean score, standard deviation (SD) and percentage were used to analyse the data, while written data were analysed using thematic analysis. Mean scores and interpretations for the five-point Likert scale statements are as follows. A mean score from 1.00-1.80 is very low (strongly disagree); 1.81-2.60 is low (disagree); 2.61-3.40 is moderate (neutral); 3.41-4.20 is high (agree) and 4.21-5.00 is very high (strongly agree).

Results

The survey’s demographic questions revealed that there were 79 participants in the study, 26 males and 53 females, and of these 24 were first-year students, 30 second-year students, and 25 third-year students. Prior to the Covid-19 pandemic, 57 students had had no experience with online learning, while 25 had. The two main types of learning encountered during the pandemic were 100% online learning and blended learning (mixed online and onsite classrooms).

The second part of the questionnaire asked students about the university’s preparedness and provision of ongoing support for online education during the pandemic. The details of the students’ answers are given in the table below, and these show that the university’s communication with students and the provision of online platforms, facilities, devices, accessibility and IT support were predominantly neutral or at a moderate level. While the high rate of moderate answers indicates that the respondents had neither positive or negative views, it could also be the case that the students did not have enough information to make an informed choice. This was reflected in 52 written answers, which showed that many students did not know that the university had a scheme to loan laptops and tablets to students and that there were internet-enabled rooms available for those who lacked internet access at home. Two other issues featured prominently in students’ written comments, namely university policy regarding online education and financial support. Some subjects were taught online and some onsite, but students would have preferred the university to have a clear policy on this and to announce this in advance. As regards financial support, students would have liked the university to reduce tuition fees as they claimed that on the one hand, they hardly used any campus facilities but on the other, they had to shoulder additional expenses, such as paying for internet connections and the printing of documents.

Table 1 University Preparedness and Provision of Ongoing Support for Online Education

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>Level</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The university gives enough information regarding online learning.</td>
<td>3.44</td>
<td>High</td>
<td>0.94</td>
</tr>
<tr>
<td>The university offers students enough training regarding online learning.</td>
<td>3.37</td>
<td>Moderate</td>
<td>1.01</td>
</tr>
<tr>
<td>The university offers different online platforms for students.</td>
<td>3.35</td>
<td>Moderate</td>
<td>1.14</td>
</tr>
<tr>
<td>The university provides enough classrooms or areas for students who cannot otherwise study online.</td>
<td>3.34</td>
<td>Moderate</td>
<td>1.11</td>
</tr>
<tr>
<td>The university offers enough devices (e.g., laptops or tablets) for students to borrow for their online classes.</td>
<td>2.77</td>
<td>Moderate</td>
<td>1.21</td>
</tr>
<tr>
<td>The university provides fast internet connections for students who want to study online at the university.</td>
<td>3.23</td>
<td>Moderate</td>
<td>1.10</td>
</tr>
<tr>
<td>The university provides sufficient IT help desks to support students with their online learning.</td>
<td>3.18</td>
<td>Moderate</td>
<td>1.17</td>
</tr>
<tr>
<td>The university offers sufficient communication channels for online learning (e.g., official channels, websites and Line group chats).</td>
<td>3.41</td>
<td>Moderate</td>
<td>1.21</td>
</tr>
<tr>
<td>In general, the university has provided sufficient infrastructure and support for students during the Covid-19 pandemic.</td>
<td>3.20</td>
<td>Moderate</td>
<td>1.07</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.25</strong></td>
<td><strong>Moderate</strong></td>
<td><strong>1.13</strong></td>
</tr>
</tbody>
</table>

The third part of the student questionnaire examined students’ self-efficacy with regard to internet technology. It is believed that high technology self-efficacy would support the development of positive attitudes towards online learning, and indeed the findings reveal that students perceived themselves as competent computer users who were able to master the technology and their online learning at a high level. While the students seemed to be able to navigate problems well during their online lessons, the written data showed that the most common technological problems that students
encountered were not related to their own abilities but were generated by external factors, such as slow internet connections, problems with signals, power cuts, broken microphones or cameras, and intrusive noises.

Table 2: Students’ Self-Efficacy with Regard to Use of Technology

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>Level</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am familiar with online learning technology, such as how to join a class, submit work online, share screens, etc.</td>
<td>3.75</td>
<td>High</td>
<td>1.01</td>
</tr>
<tr>
<td>I can comfortably access learning platforms such as Google Classroom and Microsoft Team.</td>
<td>3.81</td>
<td>High</td>
<td>0.98</td>
</tr>
<tr>
<td>I can retrieve previous live lessons, pre-recorded lessons or download worksheets without a problem.</td>
<td>3.49</td>
<td>High</td>
<td>1.13</td>
</tr>
<tr>
<td>I have the skills needed to search for content or information online.</td>
<td>3.82</td>
<td>High</td>
<td>0.98</td>
</tr>
<tr>
<td>I am capable of producing digital content such as images, audio files, PPT slides, video, etc.</td>
<td>3.52</td>
<td>High</td>
<td>1.15</td>
</tr>
<tr>
<td>I think I have sufficient technology knowledge to be able to study online.</td>
<td>3.59</td>
<td>High</td>
<td>1.04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.66</strong></td>
<td><strong>High</strong></td>
<td><strong>1.06</strong></td>
</tr>
</tbody>
</table>

The fourth part of the questionnaire asked students about the characteristics of their online classes in order to gain insights to the common classroom practices of ERE during the pandemic. As seen from Table 3 below, most students learned through synchronous lessons with a set class schedule and required login times, although teachers also uploaded relevant learning materials and made these available to students so that these could be accessed at their convenience. In addition, teachers gave out electronic homework and assignments and organized online examinations. These findings were in line with the European Student Union (ESU) survey (Doolan et al., 2021), the COIMBRA group survey (Gatti et al., 2020), and the global survey by Aristovnik (2020), which showed that synchronous lessons, most often live lectures and real-time video conferences, were the most common approach to remote emergency teaching, as reported by institutions. It should be noted that while synchronous lessons were popular in this context, recording these for students to re-watch was not as popular, and this lack of flexibility meant that students who did not have internet access or who had an unreliable internet connection were more likely to miss their lessons. Although teachers divided classes into smaller groups so that students had a greater chance of participating in online classes, teachers generally did not provide sufficient digital channels for students to discuss their studies outside class. Students also found that the teachers used only a limited range of multimedia materials (e.g., no video, audio or games) in class.

Table 3: Characteristics of Online Classes

<table>
<thead>
<tr>
<th>Characteristics of online classes</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Real-time video conferencing or live lecture (e.g., Zoom)</td>
<td>68</td>
</tr>
<tr>
<td>2. Record live lectures so that students can re-watch at...</td>
<td>25</td>
</tr>
<tr>
<td>3. Pre-record videos of lectures or lessons for students to...</td>
<td>45</td>
</tr>
<tr>
<td>4. Share the audio lessons for students</td>
<td>41</td>
</tr>
<tr>
<td>5. Upload documents/materials/worksheets/homework</td>
<td>72</td>
</tr>
<tr>
<td>6. Have electronic homework and assignment and these...</td>
<td>74</td>
</tr>
<tr>
<td>7. Use a variety of media and technique such as showing...</td>
<td>30</td>
</tr>
<tr>
<td>8. Have a digital channel for students to discuss their...</td>
<td>17</td>
</tr>
<tr>
<td>9. Have students participate in online examination.</td>
<td>74</td>
</tr>
<tr>
<td>11. Divide classes into smaller groups so that students...</td>
<td>64</td>
</tr>
<tr>
<td>11. Offer or share the useful websites or variety of...</td>
<td>34</td>
</tr>
</tbody>
</table>
The fifth part of the survey asked students for their opinions on the quality of the teaching that was provided in their online classes. The result from Table 4 showed that students seemed to be broadly satisfied with this because they rated most items at a high level. In detail, while students believed that teachers were capable of using technology in their online classes, providing sufficient content and learning materials, managing the class effectively, and using different types of assessment, they also thought that teachers gave more homework and a greater number of assignments compared to when they taught in-person. They also felt that teachers were not as flexible with online classes as they could have been. The information from the written data further showed that students struggled with issues related to time management, heavy workloads and slow internet connections, and these affected the quality of teaching and learning. Thus, despite giving high scores for individual items, students’ overall rating of the quality of their online teaching was only moderate.

### Table 4 Quality of Online Teaching

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>Level</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teachers are capable of using online technology in their teaching.</td>
<td>3.87</td>
<td>High</td>
<td>0.75</td>
</tr>
<tr>
<td>The teachers provide content in an appropriate order.</td>
<td>3.91</td>
<td>High</td>
<td>0.83</td>
</tr>
<tr>
<td>The teachers can manage their online class effectively (e.g., duration, class stimulation and class control).</td>
<td>3.71</td>
<td>High</td>
<td>0.89</td>
</tr>
<tr>
<td>The teachers use a variety of teaching styles, for example when using different media, organizing online class discussions, and giving presentations.</td>
<td>3.58</td>
<td>High</td>
<td>0.94</td>
</tr>
<tr>
<td>The teachers tailor the lesson contents to fit online or interactive formats.</td>
<td>3.73</td>
<td>High</td>
<td>0.85</td>
</tr>
<tr>
<td>The teachers provide sufficient worksheets and handouts for students’ self-study.</td>
<td>3.84</td>
<td>High</td>
<td>0.89</td>
</tr>
<tr>
<td>Teachers allow students to ask questions more often than in traditional classrooms.</td>
<td>3.65</td>
<td>High</td>
<td>0.89</td>
</tr>
<tr>
<td>The teachers give more homework and assignments in online classrooms than in traditional classrooms.</td>
<td>3.92</td>
<td>High</td>
<td>1.03</td>
</tr>
<tr>
<td>The teachers explain homework or give assignment instructions in more detail in online classrooms than in traditional classrooms.</td>
<td>3.52</td>
<td>High</td>
<td>0.91</td>
</tr>
<tr>
<td>The teachers respond to students’ answers quicker in online classrooms than in traditional classrooms.</td>
<td>3.41</td>
<td>High</td>
<td>0.83</td>
</tr>
<tr>
<td>The teachers are more willing to listen and adjust to students’ suggestions regarding content in online classes than in traditional classrooms.</td>
<td>3.52</td>
<td>High</td>
<td>0.88</td>
</tr>
<tr>
<td>The teachers use different types of assessment to evaluate students’ performance (e.g., presentations, reports, quizzes, etc.).</td>
<td>3.84</td>
<td>High</td>
<td>0.83</td>
</tr>
<tr>
<td>The teachers are more flexible in online classes than in traditional classrooms.</td>
<td>3.34</td>
<td>Moderate</td>
<td>0.98</td>
</tr>
<tr>
<td>Overall, teachers can teach online classes as effectively as in traditional classrooms.</td>
<td>3.32</td>
<td>Moderate</td>
<td>1.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3.65</td>
<td>High</td>
<td>0.92</td>
</tr>
</tbody>
</table>

The sixth part of the questionnaire asked students to compare their experience in online and traditional face-to-face classrooms, with the questionnaire written to include questions focused on both the advantages and disadvantages of online classrooms. The first table below shows students’ responses to questions related to the benefits of online learning, while the second contains responses to questions on its disadvantages. The results indicate that students’ views of the advantages of online learning were predominantly at a moderate level, and although students ranked the benefits of learning autonomy, improvements in their digital skills, and having more time at a high level, their overall view of the effectiveness of online learning was only moderate. In the written data, for which 59 responses were received, students listed lower expenses and the time saved as the major benefits of online learning.
Table 5 The Advantages of Online Learning

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>Level</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online classrooms can replace traditional classrooms.</td>
<td>2.80</td>
<td>Moderate</td>
<td>1.10</td>
</tr>
<tr>
<td>Online learning is possible with every subject.</td>
<td>2.78</td>
<td>Moderate</td>
<td>1.27</td>
</tr>
<tr>
<td>Online learning allows students to have more time to study, as students don’t have to commute to the university.</td>
<td>3.77</td>
<td>High</td>
<td>1.17</td>
</tr>
<tr>
<td>Online learning reduces the stress of in-person studying.</td>
<td>2.71</td>
<td>Moderate</td>
<td>1.36</td>
</tr>
<tr>
<td>Online classrooms are more flexible than traditional classrooms.</td>
<td>3.20</td>
<td>Moderate</td>
<td>1.15</td>
</tr>
<tr>
<td>Online learning cuts students’ expenses.</td>
<td>3.29</td>
<td>Moderate</td>
<td>1.38</td>
</tr>
<tr>
<td>Online learning allows students to be closer to home and improves family relationships.</td>
<td>3.01</td>
<td>Moderate</td>
<td>1.22</td>
</tr>
<tr>
<td>Online learning forces students to do more self-study.</td>
<td>3.90</td>
<td>High</td>
<td>0.89</td>
</tr>
<tr>
<td>Online learning improves students’ digital knowledge and skills.</td>
<td>3.75</td>
<td>High</td>
<td>0.99</td>
</tr>
<tr>
<td>Online learning is as effective as studying in traditional classrooms.</td>
<td>2.82</td>
<td>Moderate</td>
<td>1.27</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3.20</td>
<td>Moderate</td>
<td>1.27</td>
</tr>
</tbody>
</table>

However, when asked about the disadvantages of online learning, the majority of answers were rated high or very high, in particular with regard to questions on students’ inability to enjoy university life, health problems, and difficulties concentrating as a result of spending too much time online. Differences in how students viewed the advantages and disadvantages of online learning suggest that the latter slightly outweighed the former.

Table 6 The Disadvantages of Online Learning

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>Level</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online learning reduces the chance to do pair-work, group work and to give class presentations.</td>
<td>3.41</td>
<td>High</td>
<td>1.26</td>
</tr>
<tr>
<td>Teachers give more homework and assignments in online classrooms as compensation for not studying in regular classrooms.</td>
<td>3.91</td>
<td>High</td>
<td>1.14</td>
</tr>
<tr>
<td>Online learning makes students less motivated and lazier.</td>
<td>3.81</td>
<td>High</td>
<td>1.14</td>
</tr>
<tr>
<td>It is more difficult to concentrate in online classes as there are more distractions (e.g., dropped signals, problems with privacy, noise, etc.)</td>
<td>4.08</td>
<td>High</td>
<td>1.06</td>
</tr>
<tr>
<td>Online learning prevents students asking as many questions as they do in normal classrooms.</td>
<td>3.44</td>
<td>High</td>
<td>1.13</td>
</tr>
<tr>
<td>Online learning reduces students’ experience of university life.</td>
<td>4.25</td>
<td>Very high</td>
<td>1.02</td>
</tr>
<tr>
<td>Online learning causes students to spend too much time online or to sit in the same position, and this affects their health.</td>
<td>4.43</td>
<td>Very high</td>
<td>0.85</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3.90</td>
<td>High</td>
<td>1.15</td>
</tr>
</tbody>
</table>

The last part of the questionnaire asked students to state their preferred teaching mode post-pandemic as well as to rate their overall experience with online learning. Students were asked to choose between three modes of learning post-pandemic, namely traditional classrooms, blended learning (mixed onsite and online classes), and online classrooms. The findings showed that 47% (37 students) chose traditional classrooms, while 43% (34 students) opted for blended learning. Only 10% (8 students) wanted to carry on with exclusively online classrooms.
In terms of students’ overall satisfaction with having spent over 20 months in emergency remote learning, 46% (36 students) rated this at a moderate level, 20% (16 students) rated it as high, and 11% (9 students) rated it as very high. On the negative side, 13% (10 students) viewed their experience at a low level and 10% (8 students) rated their experience at the very low level.

**DISCUSSION AND CONCLUSION**

The Covid-19 pandemic pushed educational institutions worldwide to adopt emergency remote education as their main form of instruction as they tried to ensure the continuity of educational services. Over a very compressed period of time, synchronous and asynchronous online learning delivered through devices including computers, laptops, tablets and mobile phones become the primary learning method (Selvanathan et al., 2020), but transforming core university services and training teachers and students to adjust to online learning has proved to be challenging and problematic in many regards. This research thus attempted to examine students’ perceptions of online learning.
learning, the university’s preparedness and provision of support, the quality of online teaching, their familiarity with online technology, and their attitudes towards online classrooms.

With regard to students’ experiences, although most reported that they had no prior experience with online learning, students’ answers with regard to internet and computer self-efficacy showed that their digital skills and knowledge improved during their course of study. The students also rated the quality of online teaching at a high level, but these positive aspects failed to lift students’ overall satisfaction with online learning, and the findings show that when asked about their preferred mode of study post-pandemic, many students chose face-to-face classrooms over fully online instruction. This could be partly explained with reference to a study conducted by Smith, Murphy and Mahoney (2003) that shows that students’ self-management of learning and their level of comfort with e-learning were the two main factors that predicted their level of success. In this study, while students’ self-assessment showed that they were comfortable with technology related to online learning, their reluctance to fully accept online instruction might stem from the fact that most Thai classrooms are teacher-centred and so students were not used to having to do things by themselves or to direct their own learning. Moreover, under remote emergency learning, students are required to be proactive and independent, and this might add to the pressure felt by students who lack these skills. There were also issues with students’ lack of exposure to the general experience of life at university and with students’ well-being and health, and the students viewed these two factors as being significantly negative issues that counted strongly against online classes. These findings are in fact in line with many studies showing that the abrupt transition to emergency remote learning can affect student’s health and well-being (Doolan et al., 2021, Gatti et al., 2020, and Aristovnik, et al., 2020).

If we look at other aspects of the findings starting with the university’s preparedness and provision of ongoing support for online education during the pandemic, students’ overall satisfaction with this was at a moderate level. Although the university managed to rapidly upgrade its infrastructure and deliver online education to students, there were three main issues that needed to be addressed, namely the university’s lack of communication with regard to its technology support, its lack of a clear policy on the provision of online and onsite classes, and the lack of financial support for students. While it is understandable that given differences in wealth, resources, facilities, size and location, institutions varied in the extent to which they could successfully make the transition to online education, the university should nevertheless focus on its messaging and to communicate better with students how it was prepared to help them in terms of its technological and financial support. Since the latter was the main concern for many students, the university should come up with a better suite of measures, including reduced fees. If this is impossible due to the financial commitments entailed in upgrading the facilities, the university could at least allow for tuition fees to be paid in installments. The findings also suggest that students regard blended learning as the second most preferable mode of learning, indicating that new opportunities await, assuming that efforts to upgrade infrastructure and technology do not dissipate with the ending of the pandemic. Gallagher and Palmer (2020) report the emergence of new trends in higher education as a result of the pandemic, and these include greater provision of MOOC-based degree courses, options for students to earn transferable university credits for a monthly subscription, digitalizing educational credentials, providing certificates and certifications that summarize achievements, skills or competencies, and partnering with outside industries or startups to develop online educational programs. In order to remain competitive amid the digital transformation of higher education, university executives need to think ahead and to seize exactly these kinds of opportunities, and while teachers and staff should be trained to be better able to utilize digital technology, they also need to be better informed about the changing landscape within which higher education operates.

At the classroom level, students’ views were highly favorable towards the quality of the teaching that was provided during the pandemic, but this did not translate into a preference for online classes. One explanation for this could be the fact that while teachers were capable of using digital tools to deliver online classes, they may have been somewhat inflexible and have a tendency to assign significant amount of homework. This then replicated the rigidity of traditional classrooms and undermined the appeal of online classes, which offer flexibility in terms of both time and location. It is
understandable that because the switch to emergency remote education was unplanned and took place during a crisis, “there was not enough time for teachers to plan and prepare the teaching content in a way which is usual for online courses, so most of the teaching was a more or less improvised adaptation of the content prepared for the classroom to make up for the lack of in-person classroom time.” (Farnell, Matijević and Schmidt, 2021, p.25). Given teachers’ lack of experience and expertise in online teaching, it was not surprising that in online classes, they would behave in much the same way as they would in a traditional classroom, sticking to rigid timetables and deadlines while at the same time giving students more homework, and doing this without careful consideration of whether this aligned with students’ expected learning outcomes. The teachers thus clearly need greater pedagogical content knowledge (PCK) when teaching online, which would include “technical and administrative aspects of teaching online (e.g., respectively, using platforms and tools and organizing workflows). More significantly, this includes the pedagogical foundations and knowledge of principles needed to design for, and facilitate, meaningful online learning experiences.” (Rapanta et al., 2020)

It should be noted again that this research was carried out almost two years after the initial implementation of online education, and by this time students may have become completely familiar with online technology and the characteristics of online classes. However, students’ preference for offline classes suggests that they were still struggling with the online environment, struggles that included technical challenges, health problems, their workload, and a lack of interaction with teachers and classmates. These results are in line with Chung, Subramaniam, and Dass (2020), who examined the readiness of Malaysian students for online learning amid Covid-19 pandemic and revealed that while students were moderately ready for online learning, if given a choice, more than half of the students didn’t want to continue with online learning.

This study shows how students with little to no background knowledge in online teaching navigated the rapid transition from studying in face-to-face classrooms to learning online. The results show that while students were able to adjust to a changing teaching landscape, when the crisis abates, they are likely to return to the familiarity of traditional classrooms. However, to ensure that their newly acquired digital skills are not lost when the pandemic ends, the university needs not only to keep its infrastructure and technology in place, but also to invest in developing effective online pedagogy. Teachers should be trained in how to develop content, and how to design e-curricula that accommodate students’ learning styles and provide sufficient support for them. The university should also have a clear policy on online education, and should prepare staff for the administration of digital examinations; given the ongoing technological revolution and the increasing popularity of online education, a readiness to teach online is essential for both individual teachers and for universities.

This study is limited in its applicability by the small number of participants, and the results should not be considered representative of all remote teaching. Nevertheless, as there are nearly 40 provincial universities in Thailand with similar demographic profiles, it is hoped that this study might shed some light on how students in these institutions view their online education. Because all students were studying within the English department, it might also not be possible for the results to be generalized for those in other disciplines, and future research should thus cover a larger and broader range of participants. A further issue relates to the use of self-assessment when collecting data on students’ perceived self-efficacy as it is evident that individuals tend to overestimate this (Schlosser, Dunning, Johnson, & Kruger, 2013), and this could therefore potentially lead to incorrect conclusions. With regard to future research, issues such as self-directed learning and motivation with regard to online learning should be addressed in order to generate insights into different dimensions of these issues.

To sum up, the lockdown and school closures prompted many teachers to move to emergency remote education and forced many universities to implement large-scale changes in terms of technology and practice, but whether these changes will be temporary or long-term depends on individual university’s vision of their future role and the preferences of teachers and students. If universities regard Covid-19 as a temporary setback and rush to return to normality when the crisis passes, the efforts made will have been wasted, but if universities treat the Covid-19 pandemic as an
opportunity to rethink their role and structure, this may help to create educational institutions staffed with well-trained teachers who are aware of the merits of online education and where instructors are able to deliver high-quality online content that is not simply a lesser, diminished version of face-to-face classes.

REFERENCES


https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning


Lao, R. (2020, May 1). Pandemic is exposing the gaps in Thai education. *Bangkok Post*.


Difficulties Classroom Teachers Encounter in Teaching Mathematics: A Phenomenological Study

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İnönü University

Abstract

The aim of this research is to identify the difficulties that are faced by classroom teachers in teaching mathematics and to put a current perspective. In the research, phenomenological design from the qualitative research method was applied. Participants were determined by criterion sampling, which is one of the purposive sampling methods. Semi-structured focus group interviews were conducted to determine the opinions of the classroom teachers about the problems they have in teaching mathematics. The participants of the interview are a total of 7 primary school teachers, 4 female and 3 male. Content analysis was used in the analysis of the data. As a result, primary school teachers expressed many problem areas related to gain density, insufficient lesson hours, central exam-program incompatibility, reading comprehension, associating with daily life, readiness, inadequacy of economy, lack of material, distance education, fear of mathematics, peer pressure and lack of motivation.

Keywords: Teaching Mathematics, Primary School, Primary School Teacher

DOI: 10.29329/ijpe.2022.467.5

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INTRODUCTION

In today’s world where information is produced and spread rapidly, it is expected from education to raise individuals who are able to adapt to changes quickly, are open to innovation and growth, can solve the problems they encounter in daily life (Çoban & Erdoğan, 2013), think critically, entrepreneurial, have communication skills, can empathize, be conducive to society and culture (MEB, 2018) and can produce by thinking creatively (Tutak & Güder, 2014).

Nowadays, many professions require more or less mathematical knowledge and mathematical thinking (Olkun & Toluk Uçar, 2020). To achieve an effective and efficient mathematics education in educational institutions is a requirement of being an information society (Ersoy, 1997). In a changing world, the purpose of mathematics teaching is changing, and it becomes important for individuals to use the learned mathematical knowledge in solving the problems they encounter in daily life (Güler Selek, 2020). Individuals are faced with situations where they need to use mathematics throughout their lives and they have to make mathematical decisions (Yenilmez & Duman, 2008). Because of these reasons, mathematics lessons are included in every education level from pre-school education to higher education (Baykul, 2021).

An education system aims to realize the knowledge, attitudes, skills and values that it wants to bring to individuals in a planned and systematic way (Aktan, 2020). Depending on the time, in order to meet the changing social needs, changes occur in the curriculum, as in many other fields (Dewey, 2010). Correspondingly, there has been significant changes in terms of the perspective of mathematics and how it should be taught (Olkun & Tokluk Uçar, 2020, p. 30). Within this context, the Mathematics Curriculum in Türkiye was renewed and the new program started to be implemented in 2018. The general aims in the Mathematics Lesson Curriculum are identified as; to raise individuals who have advanced mathematical literacy skills, who can adapt mathematical concepts to their daily lives, who can use mathematical terminology and language correctly, who can use their own ideas and reasoning when solving problems, who have advanced metacognitive knowledge and skills, who are able to manage their own learning processes, do research, produce and use information. (MEB, 2018). Besides, all competencies that are gained by students through education and training programs and other learning paths from primary school to higher education are determined in the Turkish Qualifications Framework (TQF) in line with the European Qualifications Framework (EQF), mathematical competence is also among these qualifications and expressed as “developing and applying mathematical thinking style to solve a series of problems encountered in daily life”. Mathematical competence includes the ability and willingness to use mathematical modes of thinking (logical and spatial thinking) and presentation (formulas, models, constructs, graphs and tables) to varying degrees (MEB, 2018).

Identifying the level of reaching the targets with the changes made in the curriculum development studies in education requires conducting continuous evaluation studies (Çobanoğlu & Kasapoğlu, 2010). Within this context, international studies enable countries to see their own situation in various fields and compare the situations of other countries with themselves (MEB, 2019) and as a guide for the development of educational goals and methods (MEB, 2016b). The Program for International Student Assessment (PISA) (OECD, 2019), which is held every three years with the participation of 15-year-old students and evaluates the extent to which students have acquired the basic knowledge and skills necessary for their full participation in social and economic life, and the mathematics of 4th and 8th grade students; and Trends in International Mathematics and Science Study (TIMSS) (IEA, 2020), which evaluates the knowledge and skills they have gained in the fields of science and science, are among these studies. Considering the results of PISA, it is seen that Türkiye is below the average in the field of Mathematics, (MEB, 2010a; MEB, 2010b; MEB, 2015; MEB, 2019; MEB, 2016a), while in the TIMMS results it was only above average at the 4th grade level in 2019 and below the average at the 8th grade level (MEB, 2020). Considering the results of the national and international exams for Türkiye; it is seen that the learning levels of students in mathematics are much lower than other learning areas and they are far behind other countries in the international arena (İlgar & Gülten, 2013). Consequently, the mathematics lessons become the
nightmare of the students (Baykul, 2021), and the life of the student who performs poorly in mathematics turns into a nightmare (Reusser, 2000). There are deficiencies and negativities in teaching and learning mathematics that cause the students to be unsuccessful. That is why, the reasons for the failure in mathematics teaching should be investigated in depth (Bütüner & Güler, 2017). It is of great importance to reveal the difficulties that teachers face in teaching mathematics in order to eliminate the failures of students in mathematics (Baştürk, 2012).

There are various studies on the problems experienced in primary school mathematics teaching. In the studies conducted with different data collection tools, it has been stated that there is no different education, program, understanding and policy for regional differences (Çalşkan & Türkmen, 2016) and rural areas (Turan & Garan, 2008). In addition, in the use of technology (Sarı & Akbaba Altun, 2015), in the field of learning numbers (Aydoğdu İskenderoğlu & Uzuner, 2017), in the concretization of mathematics with distance education (Ergen, Özışık Esranur, & Bülbü, 2022), and problematic behaviors (Kırbaş & Atay, 2017), and learning difficulties (Kaçar, 2018), explaining misconceptions (Gökkurt Özdemir, Bayraktar, & Yılmaz, 2017), problems in physical conditions, equipment (Gezgin & Bal, 2021) and lack of time (Durmuş & Ergen, 2021) found to be alive. However, in Türkiye, the mathematics curriculum changed in 2018 and brought new educational practices with it. In addition, the Covid 19 pandemic, which emerged in 2020, has caused many changes in the economic and social field. These changes have brought new applications in the field of education to the agenda. New applications have also led to the emergence of potential problems.

In today's rapidly developing science and technology, mathematics has become one of the significant learning areas. Nevertheless, Türkiye's success in international exams in the field of mathematics is not at the desired level. This shows that there are certain problems in teaching mathematics. For that reason, it is essential to determine the current problems faced by classroom teachers, who are the practitioners of the course, in mathematics teaching and to increase the success of Türkiye's mathematics lesson starting from basic education. The aim of this study is to put a current perspective through identifying the difficulties faced by classroom teachers in teaching mathematics.

**METHOD**

**Design of the Study**

In this study, phenomenology design from a qualitative research method was used. Phenomenology focuses on phenomena that we are aware of however do not have an in-depth and comprehensive understanding of. Phenomenology can be used for studies with the purpose of investigating these phenomena that we do not fully comprehend (Yıldırım & Şimşek, 2008).

In this study, it is aimed to determine thoroughly what kind of problems classroom teachers go through in teaching mathematics.

**Study Group**

In this study, criterion sampling, which is one of the purposive samplings was applied. In criterion sampling, a study group can be formed according to the criteria established by the researcher or predetermined (Yıldırım & Şimşek, 2008). As a criteria, The participants of this study were selected from classroom teachers working in the Eastern Anatolia region, with more than 10 years of professional experience. The names of the participants in the study were coded as Aslı, Büşra, Erdem, Göktürk, Şükrü, Veli and Yeliz. The characteristics of the participants are detailed in Table 1.
Table 1. Information about Participants

<table>
<thead>
<tr>
<th>Participants</th>
<th>Professional Seniority</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aslı</td>
<td>21</td>
<td>Female</td>
</tr>
<tr>
<td>Yeliz</td>
<td>22</td>
<td>Female</td>
</tr>
<tr>
<td>Büşra</td>
<td>21</td>
<td>Female</td>
</tr>
<tr>
<td>Erdem</td>
<td>15</td>
<td>Male</td>
</tr>
<tr>
<td>Veli</td>
<td>13</td>
<td>Male</td>
</tr>
<tr>
<td>Şükrü</td>
<td>21</td>
<td>Male</td>
</tr>
<tr>
<td>Göktürk</td>
<td>12</td>
<td>Male</td>
</tr>
</tbody>
</table>

Data Collection Tools

In this study, it was tried to determine the opinions of the classroom teachers about how they had problems in teaching mathematics through conducting semi-structured focus group interviews. From time to time, focus group interviews may be preferred over individual interviews. Hearing the answer of a member of the group to the questions by other individuals provides them the opportunity to form their own thoughts within the framework of this answer. To put in other words, group dynamics is seen as an important factor affecting the scope and depth of the answers which are given to the questions. Some issues that may not come to mind in individual interviews may come to mind in group interviews and it may be possible to make additional comments (Yıldırım & Şimşek, 2008).

In this research, as the answers to the problems of the classroom teachers in teaching mathematics are sought, it is aimed that the answers given by the teachers will affect the answers of the other teachers in the group in a positive way. In the focus group interviews, the questions prepared were created by scanning the literature on the subject. The questions created were presented to two classroom educators who were experts in their fields and the questions took their final form as a result of the corrections. In order to collect data in the study, answers to the following questions were sought:

- What are the difficulties you encounter in teaching mathematics?
- What are the curriculum-related difficulties you encounter in teaching mathematics?
- What are the student-based difficulties you encounter in teaching mathematics?
- What are the parent-based difficulties you encounter in teaching mathematics?
- What are the material and technology-related difficulties you encounter in teaching mathematics?
- What are the difficulties you encounter in the distance education process in mathematics teaching?
- Are/what are the different challenges you would like to add to the challenges mentioned?

Data Collection Process

In this study, it is aimed to determine the difficulties experienced by classroom teachers within the scope of primary school mathematics lessons. Within this context, a focus group interview was held. The participants of the study consisted of a total of 7 classroom teachers being 4 women and 3 men. The teaching experience of the teachers participating in the research ranges from 10 to 25 years. Before the interview, everyone’s opinion was taken into consideration to determine the appropriate date and time for all participants. In this way, it was tried to prevent any problems or disruptions during the interview.
Due to the Covid-19 outbreak, for security reasons the meeting was held on Google Meet on 05.10.2021 at 20:30. The participants attended the meeting from their houses. The meeting lasted for 2 hours and 14 minutes. The interview was recorded with the consent of the participants. During the interview, the cameras and microphones remained turned on. During the interview, 3 researchers attended the meeting, one being the moderator and the other two as rapporteurs. The questions prepared within the scope of the research were asked to all participants starting from the first question, and after the answers to the first question were completed, other questions were started. After each question, the participants were asked if they had any answers they wanted to included. Participants were given 5 minutes for each question. Flexibility was provided in the time given for some questions. The recording link of the meeting was shared with the participants to check the meeting.

Data Analysis, Validity and Reliability

In this study, firstly, the audio recordings obtained through semi-structured interviews were transcribed. Transcribed interviews were subjected to content analysis in order to be processed more deeply and to discover unnoticed concepts and themes with a descriptive approach. In content analysis, it is aimed to identify the data and to reveal the facts that may be hidden in the data (Yıldırım & Şimşek, 2008).

Codes were created with the data obtained from the interviews, which created categories and themes from these categories. After the codes, categories and themes were created, they were presented to two classroom educators who are experts in their fields, and the data were made more meaningful for the reader by making some changes on the naming and locations of some codes in line with the opinions of the experts. With the chances that are made, it is thought that the codes, categories and themes will be finalized and increase internal consistency (Aslan & Beketaş, 2019). The categories in the findings section created the theme of “Problems in Teaching Mathematics”. The categories of the study are curriculum, student, parent, material, distance education and psychological factors.

Some measures were taken by the researchers to increase the validity and reliability of the study (Aslan & Beketaş, 2019). These precautions are described below.

Validity in qualitative research refers to the fact that the researcher observes the researched phenomenon as it is and as unbiased as possible. In internal validity, an answer is sought to the question of whether the interpretations of the findings obtained in the research reflect the truth (Yıldırım & Şimşek, 2008). The interview form prepared by the researchers was presented to the expert classroom educators in order to increase the internal validity, that is, the credibility of the study. According to the feedback of the experts, the interview form was arranged in order to understand the questions and narrow their scope and took its final form. It was aimed to create a conversation atmosphere by making explanations about the purpose and importance of the study in order to prepare the participants before the interview. The answers received by the participants were given through direct quoting in the findings section. Using only interviews as a data collection tool can be shown as a factor limiting the internal validity.

External validity is related to the generalizability of research results. If the results of the research can be generalized to similar environments and situations, that is, if they can be transferred, it can be said to have external validity (Aslan & Beketaş, 2019; Yıldırım & Şimşek, 2008). It is explained in detail in the relevant sections to increase external validity, the research design, study group, data collection tools, analysis of the obtained data and how the findings were organized.

In order to increase the internal reliability, which is the consistency of the research, the data obtained as a result of the interviews were coded separately by three different researchers, and the coding and categories were renewed by matching with each other. Afterwards, a science and mathematics educator was presented to a field expert to check the consistency of the codes related to the categories, and it was aimed to ensure consistency by reaching a consensus among the researchers.
with the feedback. To prevent data loss, the findings obtained from the interview questions were presented to the reader without comment, and the interviews were recorded and transcribed.

In order to increase the external reliability of the research, the research data were appropriately discussed in the conclusion part. It was discussed among the researchers whether the results and findings section provided consistency and a consensus was reached. The results and findings section was discussed by the researchers to check if the sections provided consistency and the consensus was made.

**FINDINGS**

Findings were presented under a single theme under the name of "Problems in Teaching Mathematics". Under this theme, six categories were discussed as the curriculum, student, parent, material, distance education and psychological factors. The codes obtained from the answers of the participants under these categories are presented in the table below. In Figure 1, general information about the theme, category and codes of the study are given.

![Figure 1. Infographic on themes, categories and codes](image-url)
Table 2. Participant Views on the Curriculum Category

<table>
<thead>
<tr>
<th>Category: Curriculum</th>
<th>Şükrü</th>
<th>Yeliz</th>
<th>Büşra</th>
<th>Erdem</th>
<th>Veli</th>
<th>Aslı</th>
<th>Göktürk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain density</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Insufficient lesson hours</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
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<tr>
<td>Gain-development train mismatch</td>
<td></td>
<td>*</td>
<td>*</td>
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</tr>
<tr>
<td>Central exams (İOKBS, LGS)- program mismatch</td>
<td></td>
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<tr>
<td>Disproportionate gain distribution</td>
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<td></td>
<td>*</td>
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<td></td>
</tr>
<tr>
<td>Insufficient distributional support</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Frequent changes of the program</td>
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<td></td>
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<td>*</td>
</tr>
</tbody>
</table>

When table 2 was scrutinized, the number of participants expressing their opinions on the codes of acquisition density, distribution of acquisition and appropriateness of acquisition is higher than the others. While Erdem's thoughts on the intensity of learning outcomes are: “...I think that the curriculum is intense, it is geared towards overloading information, and it is especially intense for students at primary school level”, Aslı asserted, “...I think the gains are too much, I think they are too intense.” ...children are meeting for the first time with four procedures, I think it is much more intense.” Regarding this issue, Büşra said, “...the gains are too much. How am I going to raise them...” whereas Yeliz explained her opinions as “There were a lot of activities and gains because it was program-based...”.

One of the participants, Veli, stated his thoughts about the inadequacy of the lesson hours: “...We have a serious time problem. In other words, 5 hours of mathematics in the first grade in primary school is very insufficient.” while another participant Büşra described her views, “...If I apply it according to five lesson hours, no child will go to secondary school without learning problem solving from mathematics.”

Göktürk, one of the participants, expressed his thoughts on the problem of achievement-development incompatibility: “When we look at the achievements in the mathematics curriculum, when we look at the age status of the children, they do not match exactly.” While expressing her with the sentence Büşra asserted, “...I realized that time was a very difficult subject after I sent my daughter to school. ...It's a bit abstract for children. We hung seasonal strips, we brought calendars and clocks, and I was able to give a lot of examples.”. Regarding this subject, Aslı said, “... friends told us to measure time, these were the last topics we worked on. We couldn't settle it, it didn't settle in the minds of those children.”

While Aslı, one of the participants described her opinions on the issue of the inconsistency of central exams-outcome as “...we don't have any inconsistency in any way, the achievements are irrelevant with our exams.”, Göktürk expressed his opinions, “In other words, the exams not relevant to the basic education lessons given.”

Regarding the disproportionate distribution of gains, Veli said: “...there is an imbalance between the gains, so they did not make the distribution correctly. If we have to give an example, my teacher, there are three gains in the 1st grade program on time measurement, there are three outcomes in the 2nd grade, four outcomes in the 3rd grade, and two outcomes in the 4th grade.” While expressing his opinion with these sentences, Yeliz expressed her opinion on the subject with the sentences “...they are overloaded with the achievements in the subjects.”

One of the participants, Şükrü, stated his thoughts on insufficient institutional support, “...We changed the program, but I think that in-service training activities related to it are insufficient or not done at all.” while Göktürk stated his thoughts as, “In other words, when the student cannot solve a problem, when he encounters a problem, in the mathematics lesson, of course, as the classroom
teacher, we have to solve it first. But when we are insufficient in this regard, when we cannot offer a solution to the student regarding that issue, there is no place to turn to or there is no system to guide us.”

Şükrü, one of the participants, indicated his thoughts on the constant change of the program as “…I think that we suffer from frequent changes. Because the program is constantly changing with the government or with the changing governments.”

Table 3. Participant Views on the Student Category

<table>
<thead>
<tr>
<th>Category: Students</th>
<th>Codes</th>
<th>Şükrü</th>
<th>Yeliz</th>
<th>Büşra</th>
<th>Erdem</th>
<th>Veli</th>
<th>Aslı</th>
<th>Göktürk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading comprehension</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Inability to relate to daily life</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Readiness</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Cognitive development level</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference between students</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Lack of preschool education</td>
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<td></td>
</tr>
<tr>
<td>Inability to comprehend symbols</td>
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<td></td>
</tr>
<tr>
<td>Lack of attention</td>
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</tbody>
</table>

When Table 3 is examined, it is seen that the views of the participants on reading comprehension, inability to associate it with daily life, fear of mathematics and readiness codes are higher. Veli, one of the participants, expressed his thoughts about the students' reading comprehension problem as, “…Our biggest problem is in reading and understanding, that is, the child has difficulties in understanding, expressing himself, and explaining what he understands. This directly affects math achievement.” While Veli was expressing his thoughts as followed, Erdem said, “…now it's all about math questions for understanding what you read. Now, to expect a higher level of skill from a student who cannot do this and to expect them to solve problems, frankly, we seem to be a bit of a burden on them.”.

Yeliz, one of the participants, stated her views on the students' inability to associate mathematics with daily life: "The child does not know where to use this mathematics in his daily life, he cannot use it anyway.” while another participant Göktürk expressed it with the following sentence “…what will it do in daily life when he learns mathematics knowledge and skills, why does a child need mathematics? He should be aware of them, but he is not.”.

Göktürk, one of the participants, stated his thoughts about the cognitive development level of the students “…Maybe there is no problem at the knowledge level, you can give the information, but when the child interprets it and analyzes it with this interpretation, there is an abstract situation and the child cannot visualize it in his mind.” While another participant, Veli, stated that “…they have difficulties in problem solving, critical thinking, approaching the problem at work, acquiring such skills, which we call metacognitive skills, in terms of mathematics.”

Yeliz, one of the participants, said, “What I observed is that if a child immediately answers a problem you ask in the classroom, and the other responds a little slower or comes from behind, this can affect the child from behind negatively. For example, as I just mentioned, one of them answers immediately, while the other one has to think for three minutes or two.” Erdem said, “…readiness levels are different and we try to explain a subject to them in the same time.”

Büşra, one of the participants, said regarding the lack of pre-school education, “…We teach very comfortably with children who go to kindergarten. Unfortunately, in this environment, it remains at the level of 30%. Continuation in kindergarten. The remaining seventy percent come to us, not even counting to 20 or 10.” While Yeliz expressed her opinion with these sentences, “…As Büşra said, it
can be said that she is a preschooler. These are the children who come with ready knowledge and the children who come from behind have difficulties in terms of mathematics.”.

Şükrü, one of the participants, stated that students had problems with mathematical symbols, “... we use the expressions plus, big, decrease, so the meaning we give to these symbols is not well comprehended by the students.” Veli, one of the participants, expressed his thoughts about the students’ lack of attention, “... Apart from that, they have a lack of attention, especially in mathematics. He's having trouble concentrating.”

Table 4. Participant Views on the Parent Category

<table>
<thead>
<tr>
<th>Category: Parent</th>
<th>Şükrü</th>
<th>Yeliz</th>
<th>Büşra</th>
<th>Erdem</th>
<th>Veli</th>
<th>Ash</th>
<th>Göktürk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes</td>
<td></td>
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<td>*</td>
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<td>*</td>
</tr>
<tr>
<td>Indifference</td>
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<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Education status</td>
<td></td>
<td>*</td>
<td></td>
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<tr>
<td>Economical insufficiency</td>
<td></td>
<td>*</td>
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<td></td>
</tr>
<tr>
<td>Communication with the teacher</td>
<td></td>
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</tr>
<tr>
<td>Lack of collaboration</td>
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<td></td>
</tr>
<tr>
<td>Comparison</td>
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<td></td>
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<td>*</td>
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<tr>
<td>Inability to convey</td>
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<tr>
<td>Curriculum intervention</td>
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</tbody>
</table>

When Table 4 is analyzed, it can be seen that the number of participants expressing their opinions about the indifference of the parents is higher. Ashi, one of the participants, expressed her views on this subject as “...the parents lose interest because they can't get their homework done, they don't take care of their children, they can't understand, of course they can't teach the subjects they can't understand.” while Göktürk said, “I always express to my parents, for example, in solving problems with children, in making exercises, in order to repeat the solution that the teacher tells, to repeat what they see in the notebook, and to change the numbers, for example. But the parent doesn't even do that.”. One of the other participants, Büşra asserted, “...I mean, sometimes I'm surprised. I'm telling you, the little child says 'biy, two, three, sweetly like this, so the parents don't even consider this, we are very surprised by saying that you are not interested at all.'

Stating that the education level of the parents is an important problem, Şükrü expressed, “The literacy level is quite low, even our parents who are primary school graduates are very few. Of course, this reduces their interest in mathematics and reduces their interest in other subjects.” While Yeliz stated her thoughts as “... my parents who graduated from primary school, can read and write at least by making them read with what we have given them. But when it comes to mathematics, things change...They have difficulties in this issue because they do not know.”

Büşra, one of the participants, stated her thoughts on economic problems: “...we have a parent profile dealing with financial problems. ...The person dealing with financial difficulties pushes education into the background.” While expressing this with the following sentences, Veli asserted, “...There are many students who cannot buy many course tools and materials, such as a ruler, depending on the social and economic situation.”. On the same subject, Yeliz said, “...I have students who are seasonal workers. Because their financial strength is not good, most of their parents are unemployed.”

Talking about the communication problem between the parents and the teacher, Veli expressed his thoughts on this subject as “...the biggest difficulty I have experienced is that I have a communication breakdown with the teacher. The teacher does not pay much attention to his warnings or forgets quickly.” Büşra said, “Afghan parents are a little more close to Turkish, we can communicate well and badly. We establish ourselves with Syrians through translators. I can't call and tell them why your child didn't come to school today.”.

Ashi, one of the participants, thought of the parents' thoughts on making comparisons between students "She tries to find out what their children's levels are by comparing them to the student in that
class with the student in her own class and with the students in another class.” While Erdem stated, “...his child compares to other peers and other students in the class, he criticizes.”

While Göktürk, one of the participants, said that the problem related to the parents’ inability to convey what they know in mathematics teaching said, “...they can’t explain it even if they know it because they don’t have professional skills. ...I know the answer, for example, is in problem solving, but I cannot convey this situation to the child, these are the problems we hear from parents in general.”, Yeliz stated that, “…when it comes to mathematics, I can call it parents whether they want to, they don’t know how to explain this subject and how to get down to their level. ...The mother is calling me saying, my teacher, I am solving this question, but I cannot explain it to the child.”

Veli, one of the participants, expressed his thoughts on the problem of intervention to the curriculum: “…it gives high-level gains. For example, if I were to give an example from the first grade, for example, we do not do additions with hands or subtraction by breaking tens, but the parent makes the child do this. ...They cause incomplete and wrong learning.” While another participant Büşra said, "The child, whom we liken to something, comes to us as worse. For example, I say to the parents as long as they don’t get involved, you don’t touch them and keep it that way."

Table 5. Participant Views on the Material Category

<table>
<thead>
<tr>
<th>Category: Materials</th>
<th>Şükrü</th>
<th>Yeliz</th>
<th>Büşra</th>
<th>Erdem</th>
<th>Veli</th>
<th>Aslı</th>
<th>Göktürk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficiency of material</td>
<td>*</td>
<td>*</td>
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<td>*</td>
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<td></td>
</tr>
<tr>
<td>Preparation and use of material</td>
<td>*</td>
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<td>*</td>
<td></td>
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<tr>
<td>Indifference</td>
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<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textbooks</td>
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<tr>
<td>Level appropriacy</td>
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</tbody>
</table>

When Table 5 is examined, it is seen that the number of participants who expressed their opinions about the material deficiency code is higher. Yeliz, one of the participants, stated her thoughts about the lack of a material closet: "If you say material, it doesn't exist, even if there is, every part of it is scattered in one place." Aslı said, “I think that schools should definitely have a nice locker with materials. I think it should be in every school. But neither do we.” and Erdem said, “It would be nice if there was a laboratory, like science. In fact, math is just as important as science. ...it would be nice to have the necessary math tools in every classroom locker.”.

Regarding the subject of preparing and using materials, Göktürk said, “I can say that I am not competent enough to prepare materials for myself.” Veli expressed his opinion as, “...We have serious shortcomings about how we will use these technology tools and equipment.”. Yeliz, one of the participants, explained her views on this subject as “...As a friend of ours just said, the teacher doesn't know how to use it either, and that's strange.”

Veli, one of the participants, expressed his thoughts on the lack of interest in the material: “…I opened the closet and looked, there were so many materials that we could use on almost every subject of mathematics, however, we were not aware of this. I mean, it arrived at school, it was put there, and it’s waiting.” While expressing her words with the following words, Yeliz said, “Our friends don't need the material very much anyway.”.

While one of the participants, Şükrü, stated his views on the textbook issue as “...I think that there are not enough examples in the textbooks. Our books do not offer plenty of exercise opportunities. There are not enough problems in the books, we cannot solve them. Few like 1 or 2 lines evaluation activities. Sometimes printing mistakes are made.” Göktürk said, “The issues in the textbooks are a little easier and more concrete initially.”

Veli, one of the participants, asserted that the materials are not suitable for every grade level asserted “... my teacher has a certain standard, so he wants you to use the course materials you use in
4 grades in 1st grade as well. However, it would be better if materials and materials were prepared for this course according to the grade level.”

Table 6. Participant Views on Distance Education Category

<table>
<thead>
<tr>
<th>Category: Distance Education</th>
<th>Şükü</th>
<th>Yeliz</th>
<th>Büşra</th>
<th>Erdem</th>
<th>Veli</th>
<th>Ash</th>
<th>Göktürk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment and evaluation</td>
<td>*</td>
<td>*</td>
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<tr>
<td>Classroom management</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Participation</td>
<td>*</td>
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<tr>
<td>Concretization</td>
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<tr>
<td>Lack of motivation</td>
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</tr>
<tr>
<td>Confidentiality</td>
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<tr>
<td>Parent intervention</td>
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<tr>
<td>Peer learning</td>
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<tr>
<td>Technological inadequacies</td>
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</tbody>
</table>

When Table 6 is examined, it can be observed that the participants expressed more opinions about the issues of measurement and evaluation. Regarding the measurement and evaluation problem, Yeliz, one of the participants, said, “I had a problem with the control mechanism... It is not clear that I can see exactly what the children are doing. What operation did the child do there? What did he do or how did he solve a problem when I asked him about it? Which step was he in? I could only find out by asking. I couldn’t see it with my own eyes.” Şükü expressed his thoughts as, “We experienced the biggest problem in the evaluation. So, I don’t know exactly what we taught the student.”. Regarding the same problem, Erdem said, “I agree with what my other teachers said. We cannot determine whether or not he did it or where he did right or wrong.”

Göktürk, one of the participants, explained his thoughts on the difficulty he had in classroom management as “…They are a bit passive at the point of constantly turning on the camera. So, I can not control it. We cannot notice or control whether they are paying attention to the lesson or not.” while Ash stated, “The screens are off, the camera is off, we just call out. We call 3-5 times, then his mother comes back and says the student is asleep. We cannot control it.”

While Şükü, one of the participants, expressed his thoughts regarding the problem of participation in distance education and said, “I have 25 students, 6 of them are citizens of the Republic of Türkiye, 19 of them from Afghan and Syrian origin. 7 students participated in total.”. Yeliz said, “Out of my 17 students, maximum 9 or 10 of them were able to join the distance education lessons. No one else could attend distance education lessons.”. Another participant, Veli, said, “I had a problem with continuity. So, the child enters one day and does not enter the next.”

While one of the participants, Büşra, expressed not being able to concentrate in distance education creates a problem as “…I want to give them (children) paper. I need to do something on paper, they need to complete the pattern, but right now I can’t do them. They have to do a lot of things on paper, they have to divide, they have to cut, but we couldn’t get most of them done.”, Göktürk stated, “…I have difficulties in concretization in distance education for myself. Mathematics is a course with a lot of abstract concepts.” Veli said, “I agree with my teacher Göktürk because there are too many abstract concepts in mathematics class. Even though we say bring cutlery in front of the screen, we cannot convey it too much.”

Regarding the lack of motivation in distance education, Ash stated, “The biggest minus for me is that I couldn’t do it by feeling like a teacher. My students, also, could not become students feeling that they were students. I never liked teaching in front of the screen.” While Veli stated, “There was a lot of lack of motivation in distance education.”

While Erdem, one of the participants, explained his thoughts on the problem of privacy in distance education, “You can’t be yourself, teacher in distance education.”. Veli asserted, “You can
raise your voice in the classroom environment, but you cannot raise it there. This affects you too. Because you know from behind the screen that different people are involved in the lesson.”

While one of the participants Veli, described his opinions on the issue of parent intervention as, “... I ask a question but the parent ends up solving the question because there is that kind of an environment. To avoid embarrassment to the teacher, the parent gives instructions to the child in the background.” Erdem said, “They usually have a parent with them, for example, did that parent answer the question? That is also controversial. ... Every now and then parents may interfere.”

Erdem, one of the participants, expressed the idea that students could not benefit from peer learning in sentences “...there is no social learning in distance education. Normally, they also learn from each other in the classroom. They are deprived of learning from each other in distance education.”

Yeliz, one of the participants, expressed her thoughts about technological inadequacies as, “Many of them do not have internet, many of them do not have a computer or a smart phone at home.”

Table 7. Participant Views Regarding the Psychological Factors Category

<table>
<thead>
<tr>
<th>Category: Psychological Factors</th>
<th>Şükrü</th>
<th>Yeliz</th>
<th>Büşra</th>
<th>Erdem</th>
<th>Veli</th>
<th>Ash</th>
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<td>Codes</td>
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When Table 7 is examined, it can be seen that the participants expressed more opinions about the problem of pressure on the teacher. Aslı, one of the participants, thought about her pressure on the teacher as “When the child fails, you naturally get reactions from both the school administration, the parents and the students.” While expressing this, Veli, one of the participants asserted, “School administrations also feel the pressure of school administrations on us, rather than parents. I couldn't tell once, sir. For example, that principal entered the classroom and asked questions to the children. I'm telling you, teacher, this is not the achievement of the three classes you asked. He says no, he needs to know that.” Another participant, Büşra, expressed in other words, “A secondary school math teacher came to us one day and said, "Do you have a 1st grade book, can you give it me? I asked why. There is a student who has gone to secondary school, but now he cannot add or subtract. So he made an allusion here. You know, you didn't teach this in primary school, he brought the book to say that I can teach it. That's where he blames us. In general, we classroom teachers hear these words a lot.”

Erdem, one of the participants, said that the students put pressure on him in words, “I got a reaction for a while from the students, for example, why we do less math. When the normal mathematics curriculum works, the students said that you are taking us back.”

Regarding the fear of mathematics, Şükrü, one of the participants, said, “...There is a concept we call the fear of mathematics, a hidden concept, a secret concept. I think our students are afraid of math. ...I think we, as primary school teachers, need to focus on the concept of fear of mathematics, because the child who cannot succeed, the child who cannot do it, begins to feel alienated from mathematics.” While explaining his thoughts about the sentences, Veli expressed his thoughts as “While I was teaching 1st graders in the classroom, I noticed that children love mathematics very much and are very interested. ...but when this goes to 1, 2, 3, 4, 5, 6, 7, the child also has a fear of learning mathematics due to the imbalance of these acquisitions, as I mentioned in the first question, because these gains increase.” Aslı, one of the participants, added, “...when we force the student, we intensify the perception of fear of mathematics in the student. ... if the child says he is coming scared.”

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Aslı, one of the participants, stated her thoughts on the society's perception of mathematics, “I know that all of us have this thought on mathematics as a society, even from a part of my life as a student, was a lesson to be feared. That also creates a problem.” Erdem stated that, “Okay, parents are aware of the importance of mathematics for the future of the child, but for example, there is such an idea that parents do not care if they are successful in any course aside from mathematics. For example, being successful in Turkish and understanding what he reads are much more important as the first step, but they don't care about it. How much did he get in mathematics, they ask me, that is, the main focus is on mathematics.”

While Yeliz, one of the participants, stated her opinions on the lack of motivation as, “The thinking child is in the belief that they can’t answer anyway, so they don’t have to listen or solve the questions and finish the idea of mathematics and detach from it.” Göktürk also added “…We have many students who do not like mathematics, we have many students who develop negative attitudes towards mathematics. Some believe that they will not succeed, others because they don’t know what mathematics will do for them in the future.”

To express that the students put pressure on each other, Erdem said, “We are in a competitive environment. When students get a high score in math, for example, they are almost provocatively happy for each other, and others in the class are upset about it.” While Yeliz expressed her thoughts in sentences “Many expressions such as, you can't do it, you can’t read, you read slowly about their friends are used during recess, expressions like you read slowly are used. This is also the case in mathematics. You can’t answer, for example, you couldn’t count.”

On the parent pressure, Erdem stated his opinions in the words, “...even if it is well-intentioned, it gives a different direction to the child, it suppresses the child, it creates phobia in the child.” and Büşra expressed her opinions “Some of the parents are directing the pressure on their children, this time with things like you can't do it, you're lazy.”

CONCLUSION AND DISCUSSION

When we take the problems related to education into consideration, the difficulties experienced in primary school mathematics teaching remain up-to-date. Considering that the foundations of mathematics were laid in primary school, it is a crucial requirement to regularly state the problems experienced by classroom teachers. The aim of this research is to present the difficulties experienced by primary school teachers working at the basic education level in teaching mathematics. In terms of the context of the research, the first category created under the theme of difficulties in teaching mathematics is the curriculum. Teachers most frequently touched on the intensity of acquisition. It is noteworthy that experienced teachers, who are thought to be able to use the curriculum more effectively by making use of their past experiences while applying the mathematics curriculum (Westwood Taylor , 2013), point out this problem in the study. Although the mathematics achievements have been reduced compared to the previous programs, the opinions that the problem of intensive gains continues in the current program (Incirci, Sirem, & Sirem, 2020; Baş, 2017; Deveci & Aykaç, 2020) are in line with the results of this study, while it was also seen that some teachers complained about the intensity of the learning outcomes (Turan and Tabak, 2021). While the insufficiency of mathematics lesson hours along with the intensity of learning outcomes is expressed as an important issue by the classroom teachers, it is also stated in other studies that the lesson hours allocated to achieve the goals are insufficient at each grade level (Toptaş & Karaca, 2019; Çayci, 2018; Yılmaz & Arslan, 2019; Ayhan, 2006). Besides, it was stated that the achievements did not match the developmental characteristics of the students. Doğan (2020) stated that the gains in knowledge level in mathematics lessons decreased in the 2nd and 3rd grades, but this increased in the 4th grade. This situation can be seen as one of the reasons for the problem of disproportionate distribution of gains. In the study, it was stated that the gains were disproportionately distributed and they were more intense in certain classes. Baş (2017) stated that in the 2017 mathematics curriculum, the achievements in the 1st, 2nd and 4th grade levels were reduced, while there was an increase in the achievements in grade 3. The classroom teachers who participated in the research stated that the
One of the most emphasized issues among the difficulties arising from the students by the classroom teachers participating in the study is reading comprehension. Students having problems in comprehending what they read seriously affects their mathematics learning. There are many studies on the importance of the relationship between reading comprehension and mathematics (Vilenius-Tuohimaa, Aunola, & Nurmi, 2008; Kikas, Soodla, & Magi, 2018). Elementary school mathematics course consists of four learning areas which are “Numbers and Operations, Geometry, Measurement and Data Processing”. Students need literacy skills in all these learning areas. Because in order to be able to explain their mathematical thoughts, students need to utilize language correctly along with mathematical terminology, and establish relationships between people and objects by using the meaning and language of mathematics (MEB, 2018). Thus, this issue may be explained as one of the most salient problems. Classroom teachers stated that students also have problems associating mathematics with daily life in parallel with this problem. While students' inability to associate mathematics with daily life is seen as a long-standing challenge (Yenilmez K., 2007; Özgeldi & Osmanoğlu, 2017), being able to associate it with daily life causes students to develop positive attitudes towards mathematics and increase their motivation (Özgeldi & Osmanoğlu, 2017). Besides, when students associate mathematics with daily life, they can learn mathematics more easily and improve their thinking skills by using their previous knowledge (Stylianides & Stylianides, 2008). Within this context, it can be said that even though associating mathematics with daily life is an essential skill that students can utilize, it is still an ongoing challenge. Readiness is another of the deficiencies most frequently mentioned under this category. In the literature studies on the inadequacy of readiness levels of primary school students can be found (Yenilmez & Kakmac, 2008; Metin, 2017; Ergenç, 2011). The student's level of development, age, cognitive level and prior learning are the factors affecting the learning process. The development of students' pre-learning will also positively affect their new learning (Paydar & Doğan, 2021). In other words, good readiness of students will facilitate learning mathematics in basic education. In this context, most of the teachers mentioning this problem is seen as an important result. Classroom teachers stated that there were problems with the cognitive development level of students. Inadequate metacognitive skills such as problem solving, critical thinking and reasoning is a problem that can be effective in children's comprehension, interpretation and use of information. Because an individual who cannot use metacognitive skills cannot be aware of his own mental activities and cannot effectively control the learning process (Kahramanoğlu & Deniz, 2017). Thus, it is necessary to take the cognitive development levels of students into account in order to make sure that students learn mathematics in a qualified manner (Yenilmez & Duman, Student opinions on the factors affecting mathematics achievement in primary education, 2008). In the study, differences in individual learning speed were also stated as a problem in teaching mathematics. The fact that some learn faster than others can turn into a serious problem in the classroom. Because the teacher is responsible for bringing all children to the achievements as much as possible. This does not mean giving each student the same homework, providing the same opportunity, using the same evaluation criteria. Mathematics teaching which aims for equality is a teaching model that is sensitive to individual differences and changes according to the student (Van de Walle, Karp, & Bay-Williams, 2019). The fact that primary school teachers express this problem can be interpreted as they have problems in arranging mathematics teaching according to individual differences. Starting from early childhood education, children gaining acquisitions such as describing, patterning, comparing, equating, classifying, observing, sequencing, understanding the part-whole relationship, measuring, simple addition-subtraction, number recognition, writing and drawing graphics is desired (Ministry of National Education, 2013; Unutkan, 2007). There are related studies on the positive effects of preschool education on children's future mathematics learning (McClelland, Acock, & Morrison, 2006; Fidan & Türnüklü, 2010). It is remarkable that the classroom teachers in the research expressed the problem despite the benefits of preschool education and efforts...
to expand preschool education. In the research, it has been seen that pre-school education contributes positively to students’ learning of mathematics, while students who do not receive pre-school education have difficulties in learning mathematics in the classroom as a current problem. Students starting school without a mathematical background may result in some misconceptions. As a matter of fact, it was detected in the study that the students had trouble comprehending the symbols. This situation may be related to pre-school education, as well as other concepts such as cognitive readiness and interpersonal differences.

Success in education is team work. This team consists of stakeholders such as school, family, environment and education system. One of the most important of these stakeholders, the family’s approach, interest and attitude towards education are determinants of student success (Kolay, 2004; Akbaba-Altun, 2009). Within this context, the difficulties related to the parents of the students seem to be very important. The most frequently cited difficulty with parents is indifference. Family's interest in education has been stated as a factor growing success in various studies (Akbaba-Altun, 2009; Keçeli-Kaysılı, 2008; Brese & Mirazchiky, 2010; Çelik & Kızılaslan-Tunçer, 2020). When the the frequency of studies addressing parent indifference in the relevant literature is considered, the results of this study show that this problem still exists (Akbaba-Altun, 2009; Gezgin & Bal, 2021; Çetin, Yazar, Aydın, & Yazıcı, 2018). Similarly, parents' educational status and economic inadequacies have been the subject of many studies (Keçeli-Kaysılı, 2008; Gezgin & Bal, 2021; Sarrer, 2020). The insufficiency of the education of the parents brings issues like the lack of support to the lesson with it. When the findings of the study are examined, it can be said that the educational status of the parents and the difficulty of economic insufficiency are currently ongoing. The classroom teachers who participated in the research expressed that the parents lacked communication with the teacher and this impacted the student's mathematics achievement. The communication problem in this study was expressed as the parent's disregard for the teacher's warnings. This problem can be expressed as a serious communication-based problem, since an education-teaching process in which the parents do not communicate with the teacher and listen to their advice cannot be healthy (Karaca & Karaca, 2021). Besides, the teachers explained that the foreign students in their classrooms could not even establish basic communication with their parents, which resulted negatively in the classroom. There are various studies that overlap with these results (Güngör & Şenel, 2018; Yıldız-Yılmaz & Demir, 2021; Ergen & Şahin, 2019). The classroom teachers in the study expressed the lack of cooperation in parallel with the communication difficulties. Parents' lack of cooperation may result in the inability to fully learn mathematics achievements. Because although the teacher is an important actor in teaching mathematics in the classroom, a learning process that is not repeated and reinforced at home will not provide the desired efficiency (Özdoğan, 2021). As a matter of fact, there are studies showing that parent collaboration contributes to academic success. Nevertheless, despite the importance of parent-teacher cooperation, studies showing that there is an inadequacy in this regard support the results of the research (Keçeli-Kaysılı, 2008; Buran & Kaplan, 2021; Bektaş & Küçükturan, 2020). Making comparisons among students is another issue expressed by teachers. It was stated that parents compared their own children and evaluated their success compared to other students. Parents' high expectation of success from their children, criticizing their children for their mistakes, using negative expressions and constantly comparing them with others have a negative impact on the child's success as it reduces the child's self-confidence (Dalkılıç, 2013). Considering that comparing with peers is a common mistake especially at primary school level, this issue can be considered as an important difficulty affecting mathematics teaching. Participating teachers stated that parents want to help students in their lessons, but while doing this, they have a problem of transferring them to their children despite knowing the subjects. Parallel to this, it was stated as a difficulty that some parents teach their children mathematics achievements beyond the curriculum and this results in false learning. Dağlı and Han (2017) stated that parents have wrong attitudes and behaviors in the teaching process, while Tösten, Han and Ergül (2016) stated that parents interfere with teachers’ work and want to intervene in student achievement as an issue.

Almost all the teachers in the study stated that material insufficiency creates difficulties in teaching mathematics. Since mathematics is a science that consists of abstract concepts and develops mental thinking skills with its own language, it is recommended to use representations, concrete
materials, pictures and graphics in mathematics teaching (Yazlık, 2018). It is known that using materials in mathematics teaching affects academic success (Altun & Çatal, 2021), attitude towards the course (Kükey, Tutak, & Tutak, 2019) and motivation (İnam & Ünsal, 2017). Regardless of this, the current continuation of the material inadequacy in schools is an important problem. In addition, while the teachers stated that they had difficulties in preparing and using materials, they stated that they were insufficient in preparing materials and that they did not know how to use some existing materials. Gökmen, Budak, and Ertekin (2016) determined that teachers’ pedagogical knowledge of materials was insufficient and the materials were not used because they took time, while Bozkurt and Şahin (2013) determined that teachers did not know how to use the materials and could not provide the material. Within this context, it can be said that teachers have problems in preparing and using materials and this problem creates difficulties in teaching mathematics. The classroom teachers in the study also expressed their indifference to the materials. It is thought that this situation arises from the inadequacy of the material and the difficulty in preparing and using the material. Classroom teachers stated that the inadequacy of materials for every grade level and the inadequacy of textbooks create difficulties in teaching mathematics. Korkmaz, Tutak, and İlhan (2020) stated that the textbooks are not actively used in the lessons because of their insufficiency, while Usta and İpek (2019) stated that the majority of the problems in the textbooks require low-level cognitive skills. In this context, it is a remarkable result that the use of materials is stated as an ongoing problem despite its benefits in primary school.

During the time period of the research, the classroom teachers who participated in the study experienced the distance education process. They stated that distance education creates difficulties in teaching mathematics and that the first of these is measurement and evaluation. Özdoğan and Berkant (2020) stated that school administrators, and Saygı (2020) stated that classroom teachers expressed measurement and evaluation as an important problem of the pandemic process. With the emergence of pandemic conditions, measurement and evaluation processes were suspended in many countries, and face-to-face exams had to be done online (Özalkan, 2021). As a result, it can be said that classroom teachers are inadequate and unprepared for measurement and evaluation in distance education in mathematics teaching. For a healthy learning-teaching process to take place, to facilitate students' learning processes and to have a positive learning climate, it is expected that the teacher should have a command of classroom management (Korkut & Babaoğlan, 2010). Nevertheless, the fact that the classroom environment is online in distance education and students attend classes in front of the camera has revealed a critical issue in classroom management. The classroom teachers in the study stated that they could not see the students and did not know whether they were in front of the screen or not. As a result, they had difficulties in providing classroom management. It has been stated in other related studies that classroom management in distance education is a problem experienced at all levels of education (Dinçer & Yeşilpinar-Uyar, 2016; Fidan M., 2020; Arslan & Şumuер, 2020). It was stated by the teachers that there was a problem of participation in the lesson in parallel with the classroom management. It is an important problem that students do not attend the lesson continuously and most of the class does not attend the lessons. Because teaching mathematics is a process that requires continuity. It is seen in related studies that there are problems in class participation (Arslan & Şumuer, 2020; Demir & Özdaş, 2020). There are abstract concepts in mathematics teaching and their teaching may require concretization. However, teachers stated that they could not do this in distance education and that this created a difficulty in teaching. However, there are websites such as Matlab, Mathematica, Derive, Cabri, Excell software (Çavuş & Eskitaşçioğlu, 2016), YouTube, Okulistik, Morpa Kampüs that can be used for concretization in mathematics teaching (YouTube, 2021; Morpa Kampüs, 2021; Okulistik, 2021). Within this context, it can be thought that the teachers in the study do not have sufficient knowledge on this subject. In the distance education process, the low motivation of the students towards the mathematics course is among the difficulties mentioned. Due to its importance in teaching mathematics, low motivation may negatively affect the mathematics learning process (Akbaba-Altun, 2009; Tahiroglu & Çakır, 2014). In this context, it can be said that the stated difficulty is important because the motivation for success in distance education increases academic success (Kuloğlu, 2020). The classroom teachers in the study stated that there is no privacy in distance education, and knowing that the parents are watching them behind the screen creates an obstacle to comfortable teaching. The difficulty mentioned here can be considered as one of the basic criteria that
separates private space from public space. The privacy of the person observed in the private area decreases, his/her self disappears and the natural behavior is replaced by conditional behavior (Atmaca, Yıldırım, & Öntaş, 2021). In this context, it can be said that the transformation of the classroom environment, that is, the private space, into the public space, has a negative effect on the teacher. Parent intervention was cited as another challenge. Atmaca, Yıldırım and Öntaş (2021) stated that there is parent support/intervention in distance education and this creates anxiety, tension and unrest. In addition, among the other difficulties stated are that students cannot benefit from peer learning because their communication with each other decreases in distance education and students experience technological inadequacy. Erbil, Demir, and Erbil (2021) stated that in distance education, students cannot communicate with their peers and teachers and this may impact their learning.

In the category of psychological factors, teachers stated that the pressure put on them by parents, school administrators, other teachers and students creates difficulties in teaching mathematics. There are various studies in the related literature on psychological pressure on teachers (Şenaras & Çetin, 2018). It can be said that this situation does not reflect positively on mathematics teaching and that the pressure applied impacts the motivation of the teacher. Another difficulty noted is the fear of mathematics. Fear of mathematics can occur due to reasons such as giving too much value to mathematics in exams, perceiving mathematics as difficult, and bullying from peers and relatives (Başar & Doğan, 2020). Considering the studies on the subject (Başar & Doğan, 2020; Öztop & Toptaş, 2017), it can be stated that the fear of mathematics is an ongoing problem. The teachers participating in the research stated that the widespread belief that mathematics is the only important subject in society creates difficulties in teaching mathematics. Akkaş and Toluk Uçar (2020) stated that the participants defined mathematics under the headings of "math is difficult, math is boring, scary and math is important". In Turkish society, Mathematics teaching is always considered to be important. (Yenilmez & Duman, 2008). It can be said that it is common to interpret a student who is unsuccessful in mathematics as an unsuccessful student in general and this creates a significant difficulty in mathematics teaching. In addition, attitude towards mathematics is a very important issue in students' learning. Aside from that, students who have positive attitudes towards mathematics have higher academic success (Yücel & Koç, 2011). However, the teachers stated that the students had a lack of motivation and this reflected negatively on their learning. Cumhur (2018) stated that students' reluctance towards the lesson reduces their motivation and negatively affects their learning. Teachers also expressed that students compete with each other and that successful students in mathematics put pressure on unsuccessful students. Başar and Doğan (2020) detected that students who were exposed to peer bullying increased their fear of mathematics and negatively affected their success. Aside from peer pressure, parents' pressure on students is another problem encountered. There are various studies in the related literature on parents' pressure on students in mathematics lessons (Başar & Doğan, 2020; Dağdelen & Ünal, 2017). Within this context, pressure from parents to students may be expressed as a continuing problem.

Suggestions

The intensity of the achievements in the mathematics program, their suitability for the developmental characteristics of the students, the highlighting of individual differences and the re-evaluation of the gain/time relationship, and the classroom teachers' receiving qualified, in-service training suitable for changing programs can be expressed as an important requirement.

Adopting a learning approach that emphasizes the cooperation of teachers, students, peers and parents in mathematics teaching will facilitate the work of teachers and increase efficiency and success in mathematics teaching.

It should be noted that motivation and psychological well-being play an important role in overcoming many problems in mathematics teaching.
REFERENCES


Çelik, E., & Kızırlaslan-Tunçer, B. (2020). Relationship between the 4th Grade Students’ Academic Achievement in Turkish Course and Their Parents’ Reading Attitudes. *Journal of Mother Tongue Education, 8*(4), 1094-1114. doi:10.16916/aded.734588


Erbil, D. G., Demir, E., & Armağan Erbil, B. (2021). Examination of Primary Education Teachers’ Views on Distance Education During the Pandemic. *Turkish Studies - Education, 16*(3), 1473-1493. doi:10.47423/TurkishStudies.49745


Kaçar, H. (2018). Analysis of primary school students' mathematics learning disabilities according to their teachers' observations and experiences.


MEB. (2018). *Matematik dersi öğretim programı (İlkokul ve ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. sınıflar)*. Ankara: Milli Eğitim Bakanlığı.


Preschool Teachers' Opinions About Second Step Early Learning Curriculum*

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Abstract

Children's problem behaviour in the preschool period is a severe obstacle to social-emotional development and a precondition for maladjustment in social relationships during school life. Professionals in the field have been improving existing practices to prevent and intervene in young children's challenging behaviour. To this end, many social-emotional learning curriculums are developed and put into practice. One curriculum that supports children's social-emotional learning during the preschool period is the Second Step Early Learning. The present study looked into the practical experiences of preschool teachers implementing the second step social-emotional learning curriculum. The study group consists of 13 preschool teachers who have received educator training in this learning curriculum and implemented it at schools. The teachers were asked questions about the curriculum's general qualities, its effects on the children's development levels, and their professional development. According to the study results, all teachers stated that the second step curriculum positively contributed to children's emotional and behavioural reactions. It helped them in class management and implementation, such behaviour as having confidence, asking for help, taking responsibility, and taking responsibility-sharing improved. In addition, expressing that they observed differences in hindering anger and in-class problem-solving processes, teachers emphasised that the children were more understanding and polite to each other, especially in free-time activities. Their interaction was healthier than before, and their listening and attention spans increased. Overall, the findings show preschool teachers' experience in implementation. They recommended the curriculum to their colleagues, claiming that it contributed to their professional development.

Keywords: Social-Emotional Learning, Second Step Early Learning Curriculum, Preschool Teacher.

DOI: 10.29329/ijpe.2022.467.6

* This project is supported by Düzce University Research Fund (Project Number: 2019.27.01.1011).
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INTRODUCTION

Parents, educators and society all agree that the primary aim of the education offered to children is to raise independent, socially talented, well-rounded and responsible citizens. Until the beginning of this century, on the other hand, children's social-emotional development and well-being fell behind the cognitive and academic achievement goals of the education provided by schools. As a result, they remained neglected as a developmental area in school-based evaluation (Thomson et al., 2018). However, social-emotional competence that develops during the preschool years is critical for early school achievement as much as for an upbeat adolescence and adulthood functioning (Blair & Diamond, 2008; Denham & Burton, 2003; Fraser, 1996; McClelland, et al., 2013; Rhoades, et al., 2011). As a result of the negligence of social-emotional development, recent studies reveal that emotional and behavioural problems are frequently observed in preschool children (Doi, et al., 2018; Justicia-Arráez, et al., 2021; Mitchinson, et al., 2020). In children having these problems, the lack of many social-emotional skills and their social and emotional incompetence affect their behaviour as much as their academic performance (Denham et al., 2013; Domitrovich, et al., 2007). Furthermore, studies on behaviour disorders draw attention to the discrepancy between the regular curricular practices for young children with challenging behaviours and effective practices that can improve these behaviours (Dunlap et al., 2006). For example, preschool teachers express that the biggest problem in managing their classes is challenging behaviours (Jalongo, 2006).

Failure to intervene in the emotional and behavioural problems seen in children on time may cause children to be excluded by their peers, their identity development to be affected negatively, and them to have difficulty adapting to school and social life (Agnafors, et al., 2021; Matthews et al., 2015; Webster-Stratton & Reid, 2003). Research shows that individuals who exhibit behavioural problems as children continue such behaviours during adolescence and adulthood (Cabrere, et al., 2017). Longitudinal studies prove the connection between aggressive and antisocial behaviour in children and violence in adolescence and early adulthood (Alink & Egeland, 2013; Huesmann, et al., 2009; Snyder, et al., 2012).

Several early intervention curriculums have been developed to avoid negative behaviours that may continue in adulthood (Hemmeter, et al., 2007). Schools are seen as the ideal environment to implement prevention curriculums. Many countries today implement curriculums to increase children’s motivation, keep them away from violence and support their social-emotional development in addition to the school curriculum (Blair, et al., 2000; Forness et al., 2000; Gülay, et al., 2011; McGoeey, et al., 2005). With these curriculums, children can experience and learn various social-emotional skills in a secure environment.

An overview of social-emotional learning

Although the concept of social-emotional learning has been studied for approximately 30 years in the literature, concerning studies have increased in number only recently in Turkey (Ogelman, et al., 2021). Many different definitions have been offered for social and emotional learning. One of the most commonly accepted definitions is "the process of acquiring the skills of knowing and managing emotions, caring and showing interest to others, building positive relationships, making responsible decisions and coping with difficulties effectively” (Moy & Hazen, 2018; Collaborative for Academic, Social, and Emotional Learning, 2005).

The Collaborative for Academic, Social and Emotional Learning (CASEL) defines social-emotional learning as a process that develops five core areas of competence: self-awareness, self-management, social awareness, relationship skills and responsible decision-making. In addition to being essential for children’s healthy development, these skills must be considered mainly for children with behavioural problems (Merrell & Walker, 2004).

Social-emotional learning starts in the preschool period and affects the person throughout life (Schultz et al., 2011). According to Jones and Doolittle (2017), children mastering social-emotional
learning skills get on better with their peers, show higher academic performance and have a more successful career in adulthood as they are mentally and physically healthier. Children who start school lacking social and emotional development skills, on the other hand, may have difficulties in learning (Türnküllü, 2004; McClelland et al., 2013). Since the long-term effects of social-emotional competence were understood, educators have increasingly been asked to support students' social and emotional development (Atwell & Bridgeland, 2019; Assessment Work Group, 2019).

Many school and community-based intervention and prevention curriculums are designed to support social-emotional learning skills (Thomson et al., 2018; Sklad et al., 2012). However, preventive early intervention curriculums are suggested to be used and popularised systematically and well-organised (Domitrovich & Greenberg, 2000; Shure, 2001; Webster-Stratton & Reid, 2003; Webster-Stratton et al., 2004). When the literature is reviewed, it can be seen that various early intervention curriculums support social and emotional learning. One of these curriculums is the Second Step Curriculum developed by the Committee for Children.

**Second Step Early Learning Curriculum (SSEL)**

SSEL, a structured and preventive curriculum indented for children's social and emotional development, includes curriculums designed for preschool (4 years), kindergarten (5 years), first, second, third and fourth-grade levels (Committee for Children, 2011; Frey et al., 2000; Neace & Munoz, 2012). SSEL aims to create a positive educational setting to reduce problem behaviours, establish feelings of respect and unity in the classroom, increase children's confidence and responsibility, prevent violence, improve academic achievement, and teach empathy. It also aims to drive attachment/relationship establishment, executive functions and self-regulation, help children make their own choices, cultivate social-emotional competence, and prepare children for kindergarten and life (Upshur et al., 2017).

The curriculum includes three core elements that regulate children's social reactions. These elements are emotions, thoughts and behaviours. The curriculum starts with empathic skills (focusing on emotions) in the first unit and deals with emotion management and self-soothing techniques in the second unit. Next, the unit includes problem-solving steps in the following parts and focuses on teaching constructive mind-sets. Finally, it scaffolds the steps of self-soothing and problem solving for children. The curriculum is implemented five days a week, and the activities last for up to 10 minutes (Brandenburg, 2018; Upshur et al., 2017). SSEL is a structured curriculum consisting of 20-28 lessons for each class. Each lesson includes an illustrated portrayal of a life event as a learning stimulus that provides a stimulus to discuss the given skills and suggests role-play activities to display.

Findings of research on the effect of the curriculum reveal that children who receive SSEL have considerably better executive function skills than children who do not receive the curriculum (Upshur et al., 2017). Their social-emotional skills are better than other children (Frey et al., 2005; Low et al., 2015; Taylor et al., 2017). Furthermore, violent behaviours decreased, and knowledge of social skills increased among children upon completion of the curriculum (McMahon et al., 2000; Low et al., 2015). In addition, their academic skills improved, and they were more ready for the next level of education (Wenz-Gross et al., 2018).

Teachers are among the most significant shareholders that make a curriculum successful. Teachers are the core facilitators in teaching children desired behaviours (Durlak et al., 2011; Larsen & Samdal, 2011; Jennings & Greenberg, 2009). Greenberg and Kusche (2006) highlight that teachers should be provided with the required knowledge and strategies to develop social-emotional skills in children, and they need the concerning curriculum and its materials. When preschool teachers are taught strategies related to possible challenging behaviours in their classes, they can decide which practice would be more effective in case of an undesired behaviour in the class and act accordingly (Sugai & Horner, 2009). Therefore, teachers are provided with guidelines and an informative video with the SSEL education set. The guidelines and the video emphasise teachers' responsibilities as role models and guides in developing children's social and emotional learning skills. (Committee for
Children, 2011; Larsen & Samdal, 2011). In addition, prior to implementing the second step curriculum at schools, teachers are given teacher training on the importance of social-emotional learning and the implementation of the second step curriculum (available at www.secondstep.org).

The Present Study

Early intervention in children's problem behaviours and supporting their social-emotional development is possible by designing, implementing and evaluating curriculum in and outside the school involving parents and society (Payton et al., 2008). Social-emotional learning curriculum suitable for and applicable to children's development are needed, particularly in preschool and primary education (Raver, et al., 2002). As the authorised representative of the Committee for Children in Turkey, The Social-Emotional Learning Academy has been offering teacher training to teachers and providing schools with the second step curriculum since 2009. Second Step is a paid early intervention curriculum. Moreover, only a few studies look into the effects of the SSEL on preschool children's social-emotional learning skills. Based on the importance of equality of opportunity in education, the researchers developed a scientific research project to enable children attending state schools to benefit from the second step curriculum. With the support of the Duzce University Committee for Scientific Research Projects, for the first time in our country, the SSEL was supplied and made available for state-run kindergartens' use for long years. In addition, preschool teachers working at state schools were given second step teacher training free of charge. The present study examined curriculum-related experiences of preschool teachers who received the SSEL and implemented the curriculum at various schools. In this regard, answers were sought for the following questions:

1. What are preschool teachers' evaluations of the general qualities of the curriculum?
2. How did the curriculum contribute to children's development?
3. How did the curriculum contribute to teachers' professional development?
4. What are the preschool teachers' recommendations to improve the curriculum?

METHOD

Research Design

The study asking for preschool teachers' opinions about their practice experiences employed the qualitative research approach. Since teachers' observations and experiences played a determining role in the success of the SSEL, the study adopted the basic qualitative research model, which "deals with the meaning attributed to experiences by individuals" (Merriam & Tisdell, 2016).

Participants

The study was conducted with 13 preschool teachers working in state-run kindergartens in the centre of Düzce Province. The criterion sampling technique was performed. The inclusion criteria were accepted as receiving the training on "the Second Step Early Learning" intervention curriculum and working at state-run kindergartens with children aged 4-6. Demographic data of the teachers included in the scope of the study are presented in Table 1.
Table 1. Demographics of the preschool teachers

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Groups</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>≤ 30</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>31-36</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>37-42</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>≥ 43</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Professional experience</td>
<td>5-10 years</td>
<td>6</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>11-16 years</td>
<td>5</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>≥ 17</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Educational level</td>
<td>Bachelor’s degree</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Master’s degree</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Age group of implementations</td>
<td>≤ 20</td>
<td>4</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>≥ 21</td>
<td>9</td>
<td>31</td>
</tr>
</tbody>
</table>

Five of the teachers who participated in the study are aged 30 and under, while five are 31-36. As for their professional experience, six have 5-10 years of experience. Twelve of the teachers hold a bachelor’s degree. When the groups of classes where the second step curriculum was implemented are examined, seven are groups of children aged five years and class size in 21 and over in 9 of the classes.

Data Collection Tools

A semi-structured interview form consisting of items to cover the aim of the present study was employed as the data collection tool. While developing the interview questions, studies on the curriculum content and implementations and the curriculum evaluation processes were reviewed. Based on the review, 13 interview questions were developed and presented for expert opinion. Finally, the items were given their final form following the opinions of one academic among curriculum trainers and one academic who specialised in preschool education. The distribution of the interview questions according to the research questions is shown in Table 2.

Table 2. Interview questions

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Interview Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are preschool teachers’ evaluations of the general qualities of the curriculum?</td>
<td>1.1. What is your opinion about the curriculum materials? (Music, puppets, posters and cards, teacher guidance cards)</td>
</tr>
<tr>
<td></td>
<td>1.2. What is your opinion about the subjects and skills included within the curriculum's scope?</td>
</tr>
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<td></td>
<td>1.3. What do you like most about the Second Step curriculum?</td>
</tr>
<tr>
<td></td>
<td>1.4. Are there any challenges you faced when implementing the curriculum? If yes, please share.</td>
</tr>
<tr>
<td>2. How did the curriculum contribute to children's development?</td>
<td>2.1. Do you think the activities are appropriate for the children's developmental level?</td>
</tr>
<tr>
<td></td>
<td>2.2. Do you think the curriculum is effective in the children's development? If yes, what kind of contributions do you think it makes?</td>
</tr>
<tr>
<td></td>
<td>2.3. Did you observe any changes in the children's behaviours during the period you implemented the curriculum?</td>
</tr>
<tr>
<td></td>
<td>2.4. Can you evaluate the attitudes held by the children towards curriculum activities?</td>
</tr>
<tr>
<td>3. How did the curriculum contribute to teachers' professional development?</td>
<td>3.1. Do you think the curriculum contributed to your personal and professional development? If yes, what kind of contributions do you think it made?</td>
</tr>
<tr>
<td></td>
<td>3.2. Do you think the training provided prior to the curriculum was sufficient for you to learn about the curriculum?</td>
</tr>
</tbody>
</table>
4. What are the preschool teachers' recommendations to improve the curriculum?

4.1. What would you recommend for the improvement of the Second Step curriculum?
4.2. Are there any other subjects/themes/skills you can recommend that should be added to the curriculum?
4.3. As an educator, how would you recommend this curriculum to a colleague or parents?

Data Collection and Analysis

Within the scope of the Second Step project, teacher training on the curriculum was given to 18 preschool teachers working in five state-run kindergartens. 3 teachers working with three-year-olds were excluded from the scope of the study. 2 teachers could not participate in implementations due to locational change. The curriculum, designed for 28 weeks in the 2019-2020 academic year, was completed through online practices for twelve weeks upon the school closure due to the pandemic restrictions at the end of week sixteen. One week after completing the implementation, online and telephone interviews were held with the teachers.

With the expectation that themes come out from the interview questions, the questions were left broad (Creswell, 2007). The primary goal is that the participants provide data for the researcher to define the main themes occurring naturally (Creswell, 2015). Therefore, main descriptive categories were generated for coding and content analysis was used to analyse the documents. Content analysis is a technique that helps researchers analyse the significant data resources they have (Merriam & Tisdell, 2016). Two researchers studied and coded data separately, and four main themes were created. Once the codes and themes were specified, their relations were revealed, and the findings were obtained.

Validity and Reliability

For the validity and reliability of the research, some strategies suggested by Merriam and Tisdell (2016) were discussed. The first of these is member checks. After the interviews were transcribed, they were sent to the teachers in the study group and asked if they were reasonable. In addition, peer assessment was made. This review was conducted by a colleague and researcher familiar with the research. It was taken to screen some raw data from a colleague and evaluate whether the findings were reasonable based on data. In addition, one-to-one quotations from participant responses were included in the findings to enrich the data. Finally, Düzce University Clinical Research Ethics Committee approved the study, ensuring that the ethical procedures were fulfilled.

RESULTS

The findings are presented in categories and codes under four main headings, including examples of teachers' quotations:

Evaluation of the General Qualities of the Curriculum

When the teachers' opinions on curriculum materials were examined, it was seen that the teachers approached the materials from two aspects and expressed their opinions about the qualities of the materials in general and the qualities of individual materials. Regarding the overall quality of the materials, 17 opinions were grouped under four themes. The teachers thought that the materials were interesting (n=7), attention-grabbing for children (n=4), appropriate for their age and development (n=4) and supportive for children to express themselves (n=2). For instance, T9 expressed that the implementation and curriculum were attention-grabbing and facilitated learning, while T5 stated that the materials were followed with interest by children. Evaluating the materials individually, on the other hand, the teachers expressed 22 opinions concerning the puppets, music, posters and cards, and the teacher guidance cards. The teachers found each material visually and audibly exciting and expressed that the puppets were very supportive in the teaching process (n=4), posters and cards were simple and understandable (n=6). At the same time, the musical pieces remained a little slow and long (n=2), but they were still fun (n=1). Examples of teachers' opinions under this theme are as follows:
"The musical pieces used in the curriculum were fun, posters and cards were both large enough in size to attract children’s attention visually. Teacher guidance cards were also explanatory with the smallest details and were easy to use." (T10)

"Puppets aroused a lot interest among children and they participated in puppet activities with attention. Pictures on the cards and posters were successful in drawing attention to the subject. We could easily discuss over them. Sufficient level of explanation for teachers was useful for guidance. Instructions were clear, focused and understandable." (T12).

When teachers’ opinions about the subjects and skills dealt with within the curriculum’s scope were examined, teachers were seen to have expressed 17 opinions. They reported that awareness of emotions (n=4) and emotional management skills (n=2) were supported, their awareness increased in terms of social skills (n=4), their empathy improved (n=2), problem-solving and communication skills changed (n=2). Lastly, the teachers expressed that age and development of appropriate skills and subjects were covered (n=2), and the latest learnings in the national curriculum were fostered (n=1). For example, T1, one of the teachers, saying that children's awareness of their feelings increased, expressed his/her opinion as follows; "there are subjects that enable children experiencing emotional challenges to know themselves". Similarly, T7 said, "the subjects covered for emotional management for children were useful; they helped children manage themselves emotionally". Teachers who also stressed the contribution to children's social skills expressed opinions as follows:

“What we find most challenging in our classes is to support empathising and problem solving skills and I think it was beneficial in presenting them with attention-grabbing activities.” (T6)

The teachers were asked to evaluate the aspect they liked most about the curriculum, and they expressed 22 opinions under five different categories. The teachers said they liked the rich material support most about the curriculum (n=8) and that these materials were supported with planned activity flows (n=4). For example, T2 thought that the puppets and illustrated cards were explaining and provided guidance for teachers; T6, on the other hand, stated that she/he liked the planned educational content enriched with materials. In addition, the teachers also underlined the curriculum’s contribution to children's social-emotional development (n=4) and cognitive development (n=5). Some expressions highlighting the contribution to children's development are as follows:

“.focusing on the neglected domain of social-emotional development is very important in my opinion, children who do not know their emotions may have difficulty in communication and expression” (T1)

“Children’s attention increased, even introverted children participate in practices willingly” (T8)

“Bringing children to think, improving their expression skills, encouraging them to work together and share in group activities, discovering their creativeness are the best aspects of the curriculum” (T11)

When evaluating the challenges they encountered while implementing the curriculum, the teachers expressed 13 opinions in different dour categories. They stated that they had no difficulty during the implementation process (n=7). However, the teachers highlighted that they found it challenging to integrate the curriculum into their daily educational flow (n=3). T2 explained this difficulty by saying, "Instead of integrating the practice into the classical daily plan, I had to place it at the end of the day or in between two activities, but maybe this was a choice, not a challenge for me, I do not know”. T11 stated that she/he had to conduct two curriculums concurrently within his/her educational flow at the beginning. In addition, the teachers thought the explanations at the beginning of activities were a little long (n=2), which caused a distraction for children. One teacher (T12), on the other hand, expressed the difficulty caused by a large class size as follows: “Because of the large class
size, I had difficulty in communicating with each child. It would be much easier to implement in classes of smaller size.”

**Developmental contribution of the curriculum to children**

Under the theme with which the teachers were asked to evaluate the curriculum’s contribution to children’s development, all the teachers stated that the curriculum made a positive contribution to children’s development. They expressed 15 opinions in seven categories. After they started implementing the curriculum, the teachers observed that children gave emotional and social support to each other (n=4). They reported improvement in such behaviours as feeling confident, asking for help, taking responsibility and sharing. They also observed changes in hindering anger (n=2) and in-class problem-solving skills (n=1). T2 observed that children were more understanding and polite during free-time activities, especially to each other. They also underlined that children's communication with each other was healthier (n=3), and their listening (n=1) and attention (n=1) spans increased. Some teacher expressions are as follows:

“...doing soothing exercise when they get angry and supporting each other emotionally.” (T1)

“I observed that they could know their feelings better and could differentiate them more easily” (T5)

“I saw that the children expressed themselves better. I observed improvement in values education subjects like confidence, responsibility and sharing.” (T10)

The teachers expressed 27 opinions in mainly four categories when evaluating the children’s attitudes towards the activities, and all of them stated that children participated actively. The teachers stressed that children waited for the activities in interest (n=8), curiosity (n=4) and excitement (n=4). One teacher explained the children’s interest in the visual materials as follows:

“Especially with visuals and puppets, I observed that children followed with interest and participated in the activities.” (T5)

Moreover, some teachers expressed that children’s interest and curiosity increased over time, saying:

“Every time I took the box to the classroom, they got very excited, and I saw their curiosity. One more thing, I think due to the high number of visual materials, information was more permanent.” (T2)

“They had lower interest when we first started to implement the curriculum while their interest rose as we spared time for it every day regularly and started using the materials. As we proceeded with the subjects, their listening skills and empathic skills improved, they began to solve their problems themselves instead of telling me and they supported each other in this respect” (T6)

“The children performed the curriculum activities willingly and interestedly” (T8)

**Contribution of the curriculum to teachers’ professional development**

All the teachers expressed that the curriculum contributed to them in professional terms. Expressing 18 opinions in four different categories, the teachers stated that they learnt different and effective practices, particularly for children’s social-emotional development (n=8). They also mentioned the opportunities to use different materials (n=4), communicate with the children in the class (n=3) and implement the curriculum (n=2). For example, T1 said she/he learnt different practices and activities that would contribute to children's development. Likewise, T4 explained the curriculum's contribution to himself/herself saying, “It was a great pleasure to use various activities and materials to contribute to children's social-emotional development both for myself and children
Sample expressions from teachers who stated that the curriculum contributed to their in-class communication with the children are as follows:

“Yes, it contributed in terms of finding long lasting solutions for negative situations that come up in the class” (T7)

“I believe it contributed. I learnt the ways of approaching children to make them aware of their emotions.” (T9)

They highlighted the contributions of different practices and activities with the following sentences:

"Such different types of practices both broaden teachers' perspectives and help us socialise by exchanging information with other teachers who implement the curriculum in the school." (T2)

"I realised that I was not fully sufficient while trying to teach the skills covered by the curriculum before we started to implement it and that the skills were more permanent when they were thought using different materials and by extending over a longer period of time" (T6)

When teachers' opinions about the training competence that teachers received from the implementation of the curriculum were examined, it was seen that all the teachers (n=13) agreed on having received competent training as well as having an enjoyable and fruitful training period.

Recommendations for the Curriculum

The teachers who participated in the training and practice processes of the SSEL were asked about their recommendations to contribute to the curriculum. Possible recommendations to improve the curriculum content were asked to teachers, and while some teachers (n=6) found the content sufficient, some others made explanations in five different categories. T11, one of the teachers (n=3) who said visual and material diversity could be increased, expressed that diversification can be done according to children's interests and requests. Moreover, thinking that using more straightforward language would be more beneficial for both parents and teachers. A teacher (T2) expressed his/her opinion with the following sentences: "In the parent participation part, another study can be conducted to make families understand more easily. With fewer texts, more visuals. Because such easy methods might be preferred as asking an authority to get a quick response instead of text reading.". Some teachers thought that more drama (n=1) and open-air activities (n=1) could be included. In addition, the teachers were asked about different themes or skills that could be added to the curriculum, and they expressed that they found the curriculum content sufficient in general (n=10). One teacher (T4) recommended that simple, applicable, and more concrete activities could be included for younger age groups.

When asked, "What would the reason be if you recommended the curriculum to your colleagues or parents as an educator?" all the teachers said they would recommend it. Most of the teachers claimed that supporting children's social-emotional development is critical today (n=10). For example, T7 recommended the curriculum to his/her colleagues, saying, "generally we get lost in academic skills and take activities for social-emotional development for short times. Thanks to the curriculum, we can spare time for daily social-emotional development activities." Some teachers (n=2) expressed that it is vital to implement the curriculum in all institutions, and T10 supported the curriculum saying, "I think it would be more beneficial to give this curriculum to teachers and parents at all levels of education”.

DISCUSSION

One focus of the present study was to portray the implementation process of a structured social-emotional learning curriculum. The preschool teachers whose experiences were asked about
expressed that although implementing a structured curriculum with its specific materials and content along with the existing preschool curriculum they were already teaching seemed to be challenging at first. However, they did not have difficulty thanks to the detailed instruction and curriculum materials within the daily flow. Similar to our finding, Allen, Livingston, and Nickerson (2020), found that teachers were concerned about the curriculum practices initially, but their experiences of practice turned out to be positive. Addressing the material support, the teachers stated that the planned and understandable unit cards, puppets, and illustrated cards attracted children's attention and facilitated teachers' implementation. Likewise, Durlak et al. (2011) examined the effects of the social-emotional learning curriculum. They concluded that children found it boring to learn in ordinary learning environments, but they actively participated in activities with extra-curricula. Therefore, it is not surprising that the teachers emphasised the material diversity of the curriculum. SSEL includes five colourful posters, four listening rules cards, two puppets (snail and puppy), a stuffed toy called the calm bunny and a CD titled join us and sing (Committee for Children, 2011). Especially puppets, music pieces always arouse interest among preschool children and willingly help them participate in activities. With the help of the educational materials designed for teachers and included in the course and unit contents, teachers can easily follow the steps they need to take (CASEL, 2005).

The teachers think that the units and activities covered by the curriculum are appropriate for children's age and development and supplementary to the latent learnings in the national curriculum. They explained that the units have content that promotes emotional awareness, emotional management, and social skills; the subjects improved children's empathy, problem-solving, and communication. SSEL concentrates on three skills. The first one is empathy, which focuses in the definition of emotions and their possible reasons when interacting with others. Later, students learn thoughtful answers for social interactions through neutral problem-solving steps. Finally, students learn to manage their anger and intensive emotions (Frey et al., 2000; Pedraza, 2009). Jakob (2005) studied the Second Step curriculum to prevent violence and antisocial behaviours among children. At the end of the implementation, it was found that the curriculum was highly influential on children's prosocial behaviours, and there was a decrease in the aggressive behaviours of the children who received the curriculum. Schick and Cierpka (2005) implemented the curriculum with 6-9 years-old children in Germany, and an increase was observed in children's emotional competence and prosocial behaviours at the end of the curriculum. McMahon et al. (2000) implemented the Second Step curriculum for 28 weeks with 56 preschool children aged 3-5 and 53 kindergarten children aged 4-7. They reported a considerable decrease in children's problem behaviours in both groups at the end of the implementation. It was also found that children were informed about topics like social skills. Low et al. (2015) report that teachers saw the curriculum's positive effects, particularly on behavioural problems, hyperactivity, peer problems, prosocial skills, learning skills, emotion management, and problem-solving skills. Studies in the literature are consistent with the observations and evaluations of the teachers in the present study.

The teachers stated that children supported each other, and behaviours like feeling confident, asking for help, taking responsibility and sharing improved after they started implementing the curriculum. In addition, they observed changes in hindering anger and in-class problem-solving processes and highlighted that children were more understanding and polite to each other in free-time activities. Their communication was healthier than before, and their listening and attention spans got longer. Similar to this finding, Sezer (2020) concluded that the Second Step curriculum promoted children's assertiveness, self-regulation, attachment, and relation establishment skills. The results obtained in many studies in the literature support the findings. Research shows fewer problem behaviours are observed in children participating in the second step curriculum (Holsen, Smith & Frey, 2008; Weber, 2019). Besides, there has been an increase in positive social skills (Low et al., 2015), successful emotion management (Weissberg, et al., 2015), self-awareness (Bole, 2019), academic achievement and executive functions (Upshur et al., 2017). Children need less adult support (Frey, et al., 2005) and progress has been observed in children's verbal language skills (Bowi, et al., 2008). Positive effects of the short-term curriculum on children's behaviour is a significant finding of the study, which supports the results of previous studies.
As for the contribution of the SSEL to teachers' professional development, all the teachers expressed that it made professional contributions. They stated that they had a fruitful training period in the teacher training they received prior to the curriculum and experienced different and effective practices that promoted children's social-emotional development. The teachers also mentioned the facilitating effect of using different materials on establishing communication with children in the class. In the study carried out by Larsen and Samdal (2011), teachers reported that they became more sensitive with the second step curriculum. They were informed about the importance of social competence education, and they even got more open-minded and easy-going in their relationships with their colleagues. The teachers who provide children with the opportunity to discuss, role-play and solve problems in class with the training on the curriculum tend to be successful in the curriculum. Teacher training and Second Step teacher guidelines focus on key strategies to facilitate children's learning. In the teacher workshop, trainers present the curriculum's conceptual basics and offer opportunities to discuss and implement specific teaching strategies to teachers. Training for teachers concentrates on two critical aspects of the curriculum: conducting classes to develop students' skills and improving the environmental context in which these skills are expected to be used (Frey et al., 2000). Therefore, it could be asserted that the second step curriculum positively affects the social-emotional learning levels and professional development of teachers as much as of students.

While finding the curriculum content sufficient, the teachers made suggestions to improve the curriculum recommendation, such as increased material diversity, a more straightforward language, and more open-air activities. In addition, the teachers underlined the importance of promoting children's social-emotional development domains and therefore recommended the curriculum to their colleagues for use in their institutions. Similarly, in the study carried out by Ableser (2003), teachers reported that they thought the curriculum had positive effects on the school climate and recommended that it be used more commonly in schools. It might be challenging for teachers to implement a different curriculum and the existing school curriculum. However, research findings show that well-structured curriculums with understandable guidebooks and materials for teachers help teachers with classroom management and create a positive classroom climate rather than workload.

In conclusion, the present study focused on the student and teacher outcomes of the SSEL. It has been seen that a limited number of studies have been conducted so far on evaluating the observations and experiences of preschool teachers who implement the curriculum. However, it is considered that it is critically important to provide such curriculum training and open it up for experience for revealing social and emotional outcomes in children. The present study confirms that teachers can get information about the SSEL and present a curriculum in such a successful way to be a positive experience both for themselves and for their students. Teachers’ experiences increase our awareness of the popularity of SSEL. The study’s findings reveal that most of the concerns expressed by the teachers at the beginning turned out to be unnecessary after the implementation; and that there are more benefits of providing additional intervention practices at schools.

**Limitations**

The present study has some limitations. In the first place, because of the school closure due to the pandemic at the planning and implementation stage of the project, teachers could observe children’s behaviours only for 16 weeks and conducted the remaining 12 weeks distantly. Although this comes out as a limitation of the study, teachers’ general opinion is that the curriculum brought about positive results in children’s behaviours within the short-term early intervention curriculum. Based on this view, it would be meaningful to test the permanence of children’s positive behaviours in the long term.

Despite the opportunity to implement the early intervention curriculum in state schools in our country for the first time, it was managed thanks to the financial support within the scope of the project. Studies conducted on curriculum efficiency for years, offering free training and curriculum support in state schools are significant in promoting children's social-emotional learning in such a
critical period as the preschool period. In addition, it is imperative to remark that the teachers stated they benefited from the curriculum themselves.

Receiving feedback from the practitioners of the curriculum is essential for the sustainability and improvement of the curriculum; therefore, reaching out to more teachers and educators, recommendations to be gathered from further studies would bring absolute benefit to children's healthy social and emotional development.

REFERENCES


Larsen, T., & Samdal, O. (2012). The importance of teachers’ feelings of self-efficacy in developing their pupils’ social and emotional learning: A Norwegian study of teachers’ reactions to the


Relationship Between Scientific Literacy and the Attitude Towards Reading Scientific Texts: A Study on Primary School Teacher Candidates

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Abstract
The current study sought to determine the association between primary school teacher candidates’ levels of scientific literacy and their attitudes about reading scientific texts. The study used a correlational survey technique. The sample population consisted of 287 primary school teacher candidates who were enrolled in a public university in South-Eastern Anatolia's education faculty for the 2020–2021 academic year. The "Personal Information Form," "Universal Science Literacy Scale," and "Attitude Scale towards Reading Scientific Texts" were used to gather the data. During the data analysis stage, frequency and percentage values for the variables were determined. Correlation, simple regression, and multiple regression analyses were then performed. The results revealed that although teacher candidates' reading and scientific text reading rates were insufficient, their attitudes toward scientific literacy and scientific text reading were "good." The attitude toward reading scientific materials and the sub-dimensions of scientific literacy were found to be positively and statistically correlated. Along with the "habits of mind" and "meta-cognition and self-direction" sub-dimensions, it was also noted that scientific literacy is a statistically significant predictor of attitude toward reading scientific materials. Based on their findings, the researcher came up with several recommendations.

Keywords: Scientific Literacy, Attitude Towards Reading Scientific Texts, Correlation, Primary School Teacher Candidate

DOI: 10.29329/ijpe.2022.467.7

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INTRODUCTION

Countries that don't want to fall behind in the race for science and technology should prioritize providing their population with solid science education. Many nations that attempt to keep up with global studies have made the idea of scientific literacy the centerpiece of their educational objectives for this reason (Salci, 2020). In summary, as scientific fields become more significant, the idea of scientific literacy has inevitably become necessary (Boujaoude, 2002). In order to avoid falling behind these achievements on the international stage, our nation has likewise made the required efforts to emphasize scientific literacy in its science curricula (Ministry of National Education [MoNE], 2018). As a result, this idea has been covered in the 2000 Science curriculum under the heading "literate in science," in the 2005 Science and Technology course curriculum under the heading "science and technology literate," and in the 2013 and 2018 Science course curricula under the heading "science literate." Furthermore, regardless of individual differences, it has been a goal of these curricula to guarantee that all students are trained as science-literate individuals. As they educate themselves and their pupils to be science-literate individuals, instructors have tasks and responsibilities that include developing the skills necessary for scientific literacy (Bacanak, 2002; Çepni and Bacanak, 2002; Işık Terzi, 2008). For the purpose of developing science-literate people, reading and writing exercises are carried out throughout the science learning process (Glynn and Muth, 1994).

Scientific Literacy

The ability to converse, read, and write about science is how the concept of scientific literacy is defined (Norris and Phillips, 2003). Miller (1983) claims that the idea of scientific literacy is divided into two elements. The first is a person's capacity to read and comprehend a scientific document. The other is functional scientific literacy, which shows that a person is capable of expressing ideas on science-related topics as well as having an appropriate understanding of those topics. The skills, knowledge, importance, and positive attitude toward science disciplines are all highlighted in the educational curricula, along with the connections between science and technology, society, and the environment (MoNE, 2005). While Choi et al., who consider each person a universal citizen, made a little modification to this idea and called it universal scientific literacy.

Attitude towards Reading Scientific Texts

Conceptually complex scientific texts differ greatly from fictional works in terms of both structure and content. It's possible for scientific literature to include graphs, tables, figures, formulas, and images. This kind of material enables readers to organize their scientific knowledge even if they have erroneous opinions or no background in the sciences. Scientific texts include, but are not limited to essays, scientific publications, and textbooks on chemistry, physics, and biology (Kumlu et al., 2017). Unquestionably, one of the most significant things influencing how people read these texts—which are very different from fiction—is how they feel about reading them. According to Petscher (2010), there is a positive correlation between reading attitude and academic success.

Scientific Literacy and the Attitude towards Reading Scientific Texts

According to Shamos (1995), there are three alternative methods to define scientific literacy: cultural scientific literacy, true scientific literacy, and functional scientific literacy. The simplest type of scientific literacy, known as "cultural science literacy," is the possession of the bare minimum of information. While accurate scientific literacy is the most challenging of all levels of scientific literacy. For proper scientific literacy, people should possess advanced understanding. When someone has effective scientific literacy, they can read a scientific paper or article and use scientific vocabulary to discuss it or communicate about it. Koch and Eckstein (1995) assert that people who are scientifically literate should be able to comment on a scientific text, identify the principal emphasis in these texts, and form an accurate and critical perspective on scientific materials. In addition to its cognitive component, scientific literacy also has an emotive component. In order to ensure that students develop a good attitude, it is important to boost their interest in and curiosity about science.
Even while it is not enough to raise scientifically literate people on its own, cultivating a positive attitude and enthusiasm for science is one of the most crucial aspects of scientific literacy (Çelik, 2016). In order to make wise decisions, it is crucial for people who are scientifically literate to first read and comprehend scientific resources and then critically evaluate the scientific contents in these references (Gökdemir, 2020). Furthermore, one of the three competencies outlined in the PISA 2015 scientific literacy framework, evaluating data and evidence scientifically, includes outlining the premises, reasoning, and conclusions in scientific texts (MoNE, 2016). This puts forth the importance of scientific texts in scientific literacy. Therefore, an individual who is able to identify the assumptions, findings, and logic in scientific texts should first be able to have a positive attitude towards reading such texts.

Relevant Literature

A review of local and international literature revealed that numerous investigations had been carried out to determine scientific literacy (Åkdur, 2002; Chin, 2005; Corrigan, 2014; Dani, 2009; Heinsen, 2016; Huyugüzel Çavaş, 2009; Işık Terzi, 2008; Sarkar & Lee, 2001; Sülün, Işık, & Sülün, 2008; Süren, 2008). Majority of these studies have been performed with students and teachers. In addition, it was also observed that studies performed on teacher candidates had been conducted mostly on science teacher candidates (Bacanak, 2002; Can, 2007; Macaroğlu-Akgül, 2004; Özdemir, 2010) and that the number of studies on primary school teacher candidates is limited (Bacanak & Gökdere, 2009). There are few studies that concentrate on identifying the attitudes toward reading scientific textbooks (Harder, 1989), the attitudes of science teacher candidates toward reading scientific texts (Can & Öztürk, 2019), and the knowledge and attitudes of people related to reading from scientific texts, according to a national and international literature survey on studies that have focused on identifying the attitudes toward reading scientific texts (Nigro & Trivelato, 2012). In addition, studies on scientific and technological literacy levels and attitudes towards science (Yetiştir, 2007); scientific attitude, and scientific literacy associating with daily life (Ürey & Cerrah Özsevgeç, 2015), along with studies examining the correlations between scientific literacy and science teaching self-efficacy belief (Uludüz, 2017) were identified when a literature survey was conducted for determining studies on other concepts that may be related with the scientific literacy of primary class teacher candidates. It is considered that teaching the science course to smaller age groups will contribute to the positive development of the interest and attitudes of students toward science and being scientific literate individuals starting from an early age (Uludüz, 2017). Science and primary school teachers undoubtedly play the most important role in increasing the scientific literacy of students (Huyugüzel Çavaş, 2009). A small amount of research has been published in the related literature to determine the levels of scientific literacy of primary class teacher candidates, but no studies have been done in the national literature to determine how teachers or teacher candidates feel about scientific materials. Additionally, there were no studies that looked at prospective teachers of primary classes’ levels of scientific literacy and attitudes about reading scientific texts. Additionally, Peña and Paco (2004) noted that although students are interested in science and nature, they are not particularly eager to read scientific publications. The current study seeks to determine the levels of scientific literacy among primary school teacher candidates as well as their attitudes toward reading scientific texts. This is done in light of the fact that attitudes toward reading scientific texts are crucial for fostering the development of scientific literacy in children. Thus, answers have been sought to the following questions:

1. How frequently do teacher candidates read?

2. How frequently do teacher candidates read different kinds of texts (novels, short stories, poems, memoirs, history, politics, philosophy, health, personal development, science, religion)?

3. What are the perception levels of primary school teacher candidates towards scientific literacy and reading scientific texts?
4. Is there a statistically significant correlation between scientific literacy and its subdimensions and the attitude towards reading scientific texts?

5. Is scientific literacy a statistically significant predictor of the attitude towards reading scientific texts?

6. Are the subdimensions of scientific literacy statistically significant predictors of the attitude towards reading scientific texts?

**METHOD**

**Study Model**

A correlational survey model from among the general survey models was used in the present study that aims to examine the correlation between the scientific literacy states of primary school teacher candidates and their attitudes towards reading scientific texts. The reason for preferring this model was to measure two or more variables to put forth whether they are correlated or not (Lodico, Spaulding, & Voegtle, 2010). In the model, the attitude toward reading scientific texts was considered as the prediction that is the dependent variable, whereas scientific literacy and its subdimensions were considered as the predictor, that is, independent variables.

**Population and Sample Group**

The study population was comprised of 477 primary school teacher candidates continuing their education at two faculties of education of a state university in the South Eastern Anatolia Region during the 2020-2021 academic year. Target population was tried to be reached however, only 302 primary school teacher candidates stated that they would volunteer to take part in the study. Therefore, the sample group of the present study was comprised of 302 primary school teacher candidates selected based on the proper sampling method. Of these implemented scales, 287 were included in the analysis, as a result of which it was observed based on the calculations that the sample size (95% confidence interval, \( \alpha = .05 \) statistical significance) is sufficient (Field, 2009). Table 1 presents the participant data.

<table>
<thead>
<tr>
<th>Table 1. Attributes of the Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values</td>
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<tr>
<td>--------</td>
</tr>
<tr>
<td>Gender</td>
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<tr>
<td>Class level</td>
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</tbody>
</table>

It can be observed when Table 1 is examined that 72.50% of the participants are female, and 27.50% are male. Class levels indicate that 27.50% of the participants are in 1\textsuperscript{st} grade; 21.30% in 2\textsuperscript{nd} grade; 23.00% in 3\textsuperscript{rd} grade; 28.20% in 4\textsuperscript{th} grade. It was observed when age intervals were examined that 2.40% of the participants were in the 17-18 age interval; 34.80% in 19-20 age interval; 39.70% in 21-22 age interval; 16.40% in 23-24 age interval; 4.20% in 25-26 age interval and 2.40% in 27 and above age interval.
Data Collection Tools

“Personal Information Form”, “Universal Science Literacy Scale” and “Attitude Scale Towards Reading Scientific Texts” were used for collecting data.

**Personal Information Form:** The personal information form prepared by the researcher includes information on the participants, such as gender, age, class level, and reading frequency.

**Universal Science Literacy Scale:** The universal science literacy scale was developed by Mun et al. (2015) and was adopted into Turkish by Çelik and Can (2017). The scale is comprised of 48 items, four dimensions (habits of mind, character, and values, science as human endeavor, metacognition, and self-direction), and eight factors. The scale is of a 5-point Likert type scale with values ranging between; (1) “I strongly disagree” to (5) “I strongly agree”. The reliability of the scale was calculated using Cronbach alpha internal consistency coefficient; with the value determined as .91 for the general scale, as .85 for metacognition and self-direction dimension, as .81 for habits of mind dimension, as .79 for science as a human endeavor and as .76 for character and values dimension. In addition, CFA was conducted for the construct validity of the scale in order to identify whether the scale developed in another culture provides the same factor structure in the Turkish culture or not. The reliability-validity studies were repeated for the scale since a different sample group was used for the present study. The Cronbach alpha value calculated for the scale reliability was determined as .96 for the scale in general, as .93 for the metacognition and self-direction dimension, as .91 for the science as human endeavor dimension, as .87 for the character and values dimension. CFA was conducted for testing the construct validity of the scale. There is no consensus among the related researchers in the literature regarding which goodness of fit values should be reported. However, Kline (2016) states that it is sufficient to report the values of $\chi^2/df$, $p$, CFI, RMSEA, and SRMR. Therefore, these values have been reported in the present study. The goodness of fit values for the model are: $\chi^2/df=1.884$, $p=0.00$, CFI=0.886, SRMR=0.0501 and RMSEA=0.056. It can be stated that these acquired values are at an acceptable level (Gürbüz, 2019, s.34; Tabachnick and Fidell, 2013). Thus, the previously determined eight factor model was also verified with the study sample group.

**Attitude Scale towards Reading Scientific Texts:** The attitude scale towards reading scientific texts has been developed by Kumlu et al. (2017) for measuring the affective characteristics of students. The scale is comprised of 30 items and three factors (contribution of reading science texts to learning and skills, denial, and making use of science texts when possible). The scale is of a 5-point Likert type scale with values ranging between; (1) “I strongly disagree” to (5) “I strongly agree”. Cronbach alpha internal consistency coefficient was calculated for scale reliability which was .94 for the whole scale in general, .92 for the making use of science texts when possible dimension, .92 for the denial dimension, and .86 for the contribution of reading science texts to learning and skills. CFA was conducted to identify the compatibility of the scale. The reliability-validity studies were repeated for the scale since the present study was conducted on a different study group. The Cronbach alpha values calculated for the reliability of the scale were calculated as .92 for the scale in general, .90 for the making use of science texts when possible dimension, .92 for the denial dimension, and .86 for the contribution of reading science texts to learning and skills. CFA was conducted for the construct validity of the scale. The goodness of fit values for the model are: $\chi^2/df=2.231$, $p=0.00$, CFI=0.896, SRMR=0.0720 and RMSEA=0.066 as a result of the repeated CFA. These acceptable values indicate that the predetermined three-factor model has also been verified for the sample group of the present study.

Data Analysis

Descriptive statistics, regression analysis, and the Pearson Product Moments correlation coefficient were calculated using SPSS 21.0, and the construct validity analysis (CFA) was performed using AMOS 21.0. Candidates for primary school teachers’ scientific literacy and attitudes toward reading scientific texts were assessed using descriptive analysis, whereas the relationship between scientific literacy and its subdimensions and attitudes toward reading scientific texts was examined using correlation analysis. For the purposes of interpreting the correlation coefficients, the values
proposed by Pallant (2016) were taken into account (low correlation if the correlation coefficient is between= .10-.29; moderate correlation if the correlation coefficient is between=.30-.49; high correlation if the correlation coefficient is between= .50-1.0). In contrast to multiple regression analysis, which was used to determine the degree to which the dependent variable (attitude toward reading scientific texts) could be predicted by the independent variables (scientific literacy subdimensions), simple linear regression analysis was used to predict the attitude toward reading scientific texts by the state of scientific literacy. For both basic and multiple regression studies on the dataset, specific requirements must be met. Regarding simple linear regression analysis, it was found that the distribution is normally based on the findings of the normality test for the predictor (scientific literacy) and the predicted (attitude toward reading scientific texts) variables (skewness for scientific literacy -.235 and kurtosis -.310; skewness for the attitude towards reading scientific texts .226 and kurtosis -.458). Moreover, scatter diagram was examined, as a result of which it was observed that there is a linear correlation between the predictor and the predicted variables. Certain assumptions were checked prior to starting the multiple regression analysis. The fact that the VIF values ranging between 2.41 and 2.95 are below the value of 10 (Belsley, Kuh & Welsch, 1980), that the tolerance values in the .33 and .41 interval are above .20 (Field, 2009) and that the paired correlation coefficients for the dependent variables are below .80 (Tabachnick and Fidell, 2013) indicated that there is no multicollinearity issue in the dataset. In addition, outlier values were determined for 15 participants, which were excluded from the analysis to ensure that the dataset meets the normal distribution assumption. Thus, it was illustrated that the skewness and kurtosis values of the dependent (skewness .226 and kurtosis -.458 for the attitude towards reading scientific texts) and independent (skewness -.023 and kurtosis -.121 for the habits of mind dimension; skewness -.179 and kurtosis -.721 for the character and values dimension; skewness -.453 and kurtosis -.583 for the science as human endeavor dimension; skewness -.335 and kurtosis .094 for the metacognition and self-direction dimension) variables vary between −1.5 and +1.5. Hence, it can be stated based on these values that the data are distributed normally (Tabachnick & Fidell, 2013). Moreover, it was also observed that the independent variables are distributed equally in the dependent variable (homoscedasticity) and that the errors are also distributed normally.

RESULTS

Reading Frequency of Teacher Candidates

The word cloud for the responses of primary school teacher candidates to the question, “How frequently do you read?” are presented in Figure 1.

![Word Cloud](image)

Figure 1. Word Cloud for the Reading Frequency of Teacher Candidates

Figure 1 shows that the reading frequency of primary school teacher candidates is classified as every day (f=82), and once a week (f=75), every two days (f=53), once a month (f=48), once a year (f=25), and never (f=4).
Reading Frequencies of Teacher Candidates for Different Types of Texts

Table 2 presents the reading frequencies of primary class teacher candidates for different types of texts such as novels, short stories, poems, memoirs, history, politics, philosophy, health, personal development, science, and religion).

Table 2. Reading Frequencies of Teacher Candidates for Different Types of Texts

<table>
<thead>
<tr>
<th>Text Types</th>
<th>Never</th>
<th>%</th>
<th>Rarely</th>
<th>%</th>
<th>Sometimes</th>
<th>%</th>
<th>Generally</th>
<th>%</th>
<th>Always</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novel</td>
<td>4</td>
<td>1.39</td>
<td>22</td>
<td>7.66</td>
<td>40</td>
<td>13.93</td>
<td>126</td>
<td>43.90</td>
<td>95</td>
<td>33.10</td>
</tr>
<tr>
<td>Short Story</td>
<td>23</td>
<td>8.01</td>
<td>65</td>
<td>22.64</td>
<td>110</td>
<td>38.32</td>
<td>71</td>
<td>24.73</td>
<td>18</td>
<td>6.27</td>
</tr>
<tr>
<td>Poem</td>
<td>50</td>
<td>17.42</td>
<td>75</td>
<td>26.13</td>
<td>87</td>
<td>30.31</td>
<td>37</td>
<td>12.89</td>
<td>38</td>
<td>13.24</td>
</tr>
<tr>
<td>Memoir</td>
<td>96</td>
<td>33.44</td>
<td>117</td>
<td>40.76</td>
<td>54</td>
<td>18.81</td>
<td>17</td>
<td>5.92</td>
<td>3</td>
<td>1.04</td>
</tr>
<tr>
<td>History</td>
<td>51</td>
<td>17.77</td>
<td>78</td>
<td>27.17</td>
<td>88</td>
<td>30.66</td>
<td>44</td>
<td>15.33</td>
<td>26</td>
<td>9.05</td>
</tr>
<tr>
<td>Politics</td>
<td>107</td>
<td>37.28</td>
<td>70</td>
<td>24.39</td>
<td>57</td>
<td>19.86</td>
<td>33</td>
<td>11.49</td>
<td>20</td>
<td>6.96</td>
</tr>
<tr>
<td>Philosophy</td>
<td>79</td>
<td>27.52</td>
<td>98</td>
<td>34.14</td>
<td>56</td>
<td>19.51</td>
<td>33</td>
<td>11.49</td>
<td>21</td>
<td>7.31</td>
</tr>
<tr>
<td>Health</td>
<td>78</td>
<td>27.17</td>
<td>105</td>
<td>36.58</td>
<td>69</td>
<td>24.04</td>
<td>22</td>
<td>7.66</td>
<td>13</td>
<td>4.52</td>
</tr>
<tr>
<td>Development</td>
<td>41</td>
<td>14.28</td>
<td>54</td>
<td>18.81</td>
<td>93</td>
<td>32.40</td>
<td>72</td>
<td>25.08</td>
<td>27</td>
<td>9.40</td>
</tr>
<tr>
<td>Science</td>
<td>80</td>
<td>27.87</td>
<td>111</td>
<td>38.67</td>
<td>65</td>
<td>22.64</td>
<td>21</td>
<td>7.31</td>
<td>10</td>
<td>3.48</td>
</tr>
<tr>
<td>Religion</td>
<td>44</td>
<td>15.33</td>
<td>86</td>
<td>29.96</td>
<td>86</td>
<td>29.96</td>
<td>39</td>
<td>13.58</td>
<td>32</td>
<td>11.14</td>
</tr>
</tbody>
</table>

According to Table 2, it is observed when the frequencies of primary school teacher candidates for reading different text types are examined that novels (f=95) are indicated most among the types of texts that are always read, whereas politics (f=107) is stated most frequently among the least read types of texts. Moreover, it was observed when the frequencies of reading scientific texts were examined that 38.67 % of the teacher candidates stated that they rarely read scientific texts, 27.87 % indicated that they never read scientific texts, 22.64 % stated that they sometimes read scientific texts, 7.31 % stated that they generally read scientific texts and 3.48 % indicated that they always read scientific texts.

Attitudes of Teacher Candidates towards Scientific Literacy and Reading Scientific Texts and Related Perception Levels

Table 3 shows the results of the descriptive analysis conducted for determining the attitudes of primary school teacher candidates towards scientific literacy as well as their attitudes and perceptions related to reading scientific texts.

Table 3. Descriptive Analysis of the Attitude towards Scientific Literacy and Reading Scientific Texts

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>( \bar{X} )</th>
<th>SS</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Scientific Literacy</td>
<td>287</td>
<td>4.02</td>
<td>.51</td>
<td>.03</td>
</tr>
<tr>
<td>2. Attitude Towards Reading Scientific Texts</td>
<td>287</td>
<td>3.46</td>
<td>.57</td>
<td>.03</td>
</tr>
</tbody>
</table>

The fact that both scales were of a 5-point Likert type scale was taken into consideration when interpreting the arithmetic mean scores presented in Table 3. Hence, the scientific literacy states and attitudes towards reading scientific texts of the primary school teacher candidates who took part in the study were at a “good” level (\( \bar{X} = 4.02; \bar{X} = 3.46 \)).

Correlation between Scientific Literacy and Its Subdimensions and the Attitude towards Reading Scientific Texts

Table 4 presents the results of the correlation analysis conducted to identify the correlation between the scientific literacy and subdimensions of primary school teacher candidates and their attitudes towards reading scientific texts.
Table 4. Correlation Coefficients Related with the Correlation between Scientific Literacy and Sub-Dimensions and the Attitude towards Reading Scientific Texts

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Habits of the mind</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Character and values</td>
<td>.707**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Science as human endeavor</td>
<td>.715**</td>
<td>.755**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Metacognition and self-direction</td>
<td>.708**</td>
<td>.662**</td>
<td>.694**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Scientific literacy</td>
<td>.883**</td>
<td>.866**</td>
<td>.901**</td>
<td>.881**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6. Attitude towards reading scientific texts</td>
<td>.487**</td>
<td>.431**</td>
<td>.426**</td>
<td>.493**</td>
<td>.523**</td>
<td>1</td>
</tr>
</tbody>
</table>

**p<.01

The correlation coefficients presented in Table 4 reveal a positive and high level (r=.523, p<.01) of correlation between scientific literacy and the attitude towards reading scientific texts. In addition, there is a positive and moderate correlation between the attitude towards reading scientific texts and the habits of mind (r=.487, p<.01), character and values (r=.431, p<.01), science as human endeavor (r=.426, p<.01), metacognition and self-direction (r=.493, p<.01) subdimensions. Hence, it can be interpreted that an increase in the scientific literacy levels of primary school teacher candidates leads to the development of a positive attitude towards reading scientific texts, while a decrease in their scientific literacy levels results in developing a negative attitude towards reading scientific texts.

Prediction State of the Attitude of Reading Scientific Texts by the Scientific Literacy States of Primary School Teacher Candidates

Table 5 presents the results of the simple linear regression analysis conducted with regard to the prediction of the attitude toward reading scientific texts by the scientific literacy states of primary school teacher candidates.

Table 5. Results for the simple linear regression analysis conducted with regard to the prediction of the attitude of reading scientific texts by the scientific literacy states of primary school teacher candidates.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Standard Error</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.126</td>
<td>.228</td>
<td>4.929</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Science Literacy</td>
<td>.583</td>
<td>.056</td>
<td>.523</td>
<td>10.348</td>
<td>.000*</td>
</tr>
<tr>
<td>R=.523</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²=.273</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>F(1,285)= 107.083</td>
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<tr>
<td>p=.000</td>
<td></td>
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</tbody>
</table>

*p<.05

After doing a regression analysis to determine whether or not the level of scientific literacy has a statistically significant effect on one's attitude toward reading scientific materials, it was discovered that this attitude is predicted by scientific literacy (R=.523, R²=.273, F(1,285)= 107.083, p<.05). In addition, scientific literacy explains 27% of the attitude towards reading scientific texts.

Prediction State of the Attitude towards Reading Scientific Texts by Scientific Literacy Subdimensions

Table 6 presents the multiple regression analysis results conducted for the prediction of the attitude towards reading scientific texts by the subdimensions of scientific literacy (habits of mind, character, and values, science as human endeavor, meta-cognition, and self-direction).
It was observed as a result of the multiple linear regression analysis conducted to determine how variables such as habits of mind, character, and values, science as human endeavor, metacognition, and self-direction predict the attitude towards reading scientific texts that the attitude toward reading scientific texts is predicted at a statistically significant level by the habits of mind ($\beta=.228$, $t=2.758$, $p<.05$) and meta-cognition and self-direction ($\beta=.273$, $t=3.500$, $p<.05$) subdimensions of scientific literacy. In addition, it was also observed that the character and values ($\beta=.079$, $t=.945$, $p>.05$) and science as human endeavor ($\beta=.014$, $t=.160$, $p>.05$) subdimensions of scientific literacy are not statistically significant predictors of the attitude towards reading scientific texts. A 1 unit increase in the “Habits of mind” sub-dimension leads to an increase by .228 units in the attitude towards reading scientific texts. A 1 unit increase in the “Meta-cognition and self-direction” sub-dimension leads to an increase by .273 units in the attitude towards reading scientific texts. Of the attitude towards reading scientific texts, 27.0 % is explained by the habits of mind and metacognition and self-direction subdimensions of scientific literacy ($R^2=.277; p<.05$). In short, it can be stated based on the acquired findings that an increase in the “habits of mind” and “meta-cognition and self-direction” sub-dimensions of scientific literacy will contribute to ensuring that primary school teacher candidates will have a more positive attitude towards reading scientific texts.

**DISCUSSION, CONCLUSION, AND SUGGESTIONS**

The present study aimed to determine the correlation between the scientific literacy states of primary school teacher candidates and their attitudes towards reading scientific texts to identify the reading frequency of teacher candidates and the frequencies with which they read different text types. In the present study, 28.57 % of the teacher candidates stated that they read every day, 26.13 % indicated that they read once a week while 18.46 % read every two days, 16.72 % once a month, 8.71 % once a year, and 1.39 % stated that they never read. It was illustrated as a result of the study by Kuşdemir et al. (2020) with a sample group comprised of primary school and Turkish teacher candidates that 3 % of the participants stated that they last read six months ago, 11 % stated that they last read three months ago, 32 % stated that they read once a month, 27 % indicated that they read once a week while 25 % stated that they read every day. The number of teacher candidates who read every day and once a week is similar in both this study and the present study. These ratios were set forth in the study by Kolaç (2007) conducted with primary school teacher candidates as 39 % reading every day, 22.8 % every two days, 21 % once a week, 15.2 % every two weeks, 1 % once a month and 1 % stated that they do not remember. Hence, it can be indicated based on these percentages that the reading frequencies of primary school teacher candidates are not at a sufficient level in neither the aforementioned studies nor the present study. In addition, it was observed when the frequencies of reading different text types were examined that the teacher candidates always most frequently mentioned the novel (f=95), with politics indicated as the text type that is never read (f=107). The frequency of reading scientific texts illustrated that majority of the teacher candidates (66.54 %) stated that they rarely (38.67 %) or never (27.87 %) read scientific texts. Contrary to this study, Kolaç (2007) carried out a study as a result of which it was observed that the primary school teacher candidates mostly prefer books with adventure, social and emotional content; that they least prefer books with mystery and horror content with a frequency of preferring books with a scientific 8.4 % Aslantürk (2008) conducted a study in which it was reported that primary school teacher candidates mostly prefer reading humor, art, newspapers, and magazines while they least preferred scientific books and

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**Table 6. Multiple Linear Regression Analysis Results for the Prediction State of the Attitude towards Reading Scientific Texts by Scientific Literacy Subdimensions**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Standard Error</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.094</td>
<td>.233</td>
<td>-</td>
<td>4.701</td>
<td>.000</td>
</tr>
<tr>
<td>Habits of mind</td>
<td>.253</td>
<td>.092</td>
<td>.228</td>
<td>2.758</td>
<td>.006</td>
</tr>
<tr>
<td>Character and values</td>
<td>.073</td>
<td>.078</td>
<td>.079</td>
<td>.945</td>
<td>.345</td>
</tr>
<tr>
<td>Science as human endeavor</td>
<td>.013</td>
<td>.083</td>
<td>.014</td>
<td>.160</td>
<td>.873</td>
</tr>
<tr>
<td>Meta-cognition and self-direction</td>
<td>.257</td>
<td>.073</td>
<td>.273</td>
<td>3.500</td>
<td>.001</td>
</tr>
</tbody>
</table>

R=.535 $R^2=.287$ corrected $R^2=.277$ $F(4, 282)=28.330$ $p=.000$
books on scientific and technical as well as culture books. According to a study by Arslantürk and Saracalolu (2010), teachers and teacher candidates prefer reading newspapers, novels, and short stories more than academic texts, technical manuals, books on science, and books with humor. The findings of both studies are consistent with the notion that people read novels more frequently than other types of literature, while they read scientific publications less frequently. Furthermore, despite the fact that primary school teacher candidates' favorite genres of books vary among research, it is notable that they dislike scientific books, even though these books have a high likelihood of including scientific materials. Future teachers' lack of interest in reading scientific texts will surely have a negative effect on their pupils' ability to do research and ask and answer questions. There could be numerous causes for this. The fact that applicants to primary class teaching programs are typically graduates of equally-weighted departments prevents them from taking enough science courses. Their previous negative attitudes toward the science course, and their perceptions of the difficulty of scientific texts may all be taken into account. The fact that teachers encourage their students to read short stories and novels, particularly during the primary school years, and that they also set aside more time to read such texts may be the reason why novels are identified as the most often read text category.

The current study found that teacher candidates have good levels of scientific literacy. Chin (2005) found that the scientific literacy levels of teacher candidates are typically at a satisfactory level after conducting a study with primary school and science teacher candidates. Uludüz (2017), however, reported that the scientific literacy levels of primary school teacher candidates are at a sufficient level. The conclusions of the current investigation are supported by these results. Additionally, a number of other research with differing conclusions were seen in the relevant literature. However, it has been noted that this research involved science teacher candidates. The scientific literacy levels of science teacher candidates are not at the intended level, according to studies by Bacanak (2002), Yakar (2010), and Yetişir (2007). However, Ulutaş (2009) and Özdemir (2010) suggested intermediate levels, while Can and Çelik (2019) and Salei (2020) reported high levels. As a summary of this research, it can be shown that while the scientific literacy status is generally not at the desired level in studies carried out with science teacher candidates, it is found to be good in studies conducted with primary school teacher candidates. However, this conclusion is unexpected given that science teacher candidates enroll in more courses than primary school teacher candidates that will improve their scientific literacy. In the current study, teacher candidates had a positive attitude toward reading scientific texts. There are many studies in the related literature that aim to identify the attitudes of teacher candidates toward reading (Arslan, Çelik, Çelik & 2009; Bozpolat, 2010; Duman & Gökmen, 2018; Yılmaz & Benli, 2010;), while a limited number of studies was found that strives to determine the attitudes of teacher candidates towards reading scientific texts. Can and Öztürk (2019) examined the impacts of certain variables (gender, general grade point average, class level, reading frequency) on the attitudes of science teacher candidates towards reading scientific texts. Nigro and Trivelato (2012) carried out a study with students aged 14-15 to determine the knowledge and attitudes towards reading from different science disciplines, as a result of which it was observed that female students have higher scores compared with male students and that students who read scientific texts have higher scores compared with those who read textbooks. Research by Harder (1989) showed that adults have good opinions regarding reading science textbooks (anatomy and physiology). Therefore, no research has been done to directly assess teacher candidates' attitudes about reading scientific texts. It's also intriguing that the majority of the teacher candidates in the current study read scientific materials either occasionally or never, despite having a favorable attitude toward them. The likelihood that teacher candidates will favor reading scientific texts as future reading material, however, may be increased if they have a positive attitude toward reading scientific texts. When teacher candidates begin their careers, it may be said that those who adopt a good attitude toward reading scientific literature will more likely inspire their pupils to pursue science and study scientific texts.

In the current study, there was an association between scientific literacy and the mindset toward reading scientific texts that were favorable, significant, and statistically significant. During this time, it was also discovered that scientific literacy accounts for 27% of the attitude toward reading scientific texts and is a statistically significant predictor of that attitude. As a result, whereas a rise in teacher candidates' levels of scientific literacy enables them to acquire a favorable attitude toward
reading scientific texts, a drop in scientific literacy may cause them to do the opposite. In the relevant studies, no study was found that investigated the relationship between scientific literacy and reading attitudes toward scientific texts. Additionally, it is believed that students who approach scientific literature positively would also have a positive attitude toward science because of the scientific content. The few studies that have looked at the relationship between scientific literacy and attitude toward science in the relevant literature were analyzed in this regard. Ulutaş (2009) came to the conclusion that there is a positive and statistically significant association between scientific literacy and attitude toward science and that science teacher candidates' levels of scientific literacy and attitudes toward science are appropriate. While Yetişir (2007) showed in a prior study that there is a statistically significant and linear association between primary school and science teacher candidates' attitudes toward science and scientific literacy. According to research by Güçlüer (2012), boosting students' scientific literacy in the classroom has a favorable effect on their academic performance, attitude toward science, and scientific process skills. Yore et al. (2007) claimed that mathematics-literate people would experience a favorable change in their concerns, beliefs, and attitudes toward mathematics. For those who are literate in science, the same can be said. Thus, it can be concluded that people with high levels of scientific literacy will present a favorable attitude toward scientific materials, which are an essential component of these teachings. Assuring that pupils develop a good attitude toward science is one of the tasks and responsibilities of instructors for developing scientifically literate people, according to Bacanak (2002). Simply put, instructors who work hard to develop their students' scientific literacy or teacher candidates who are certain they will do so may help to ensure that their pupils have a favorable attitude toward science and reading scientific texts.

Additionally, there is a moderately favorable relationship between the attitude toward reading scientific literature and the sub-dimensions of the scientific literacy level that address habits of thought, character, and values, science as a human endeavor, meta-cognition, and self-direction. However, it was observed that only “habits of mind” and “meta-cognition and self-direction” variables from among the predictor variables are statistically significant predictors of the attitude towards reading scientific texts. The use of scientific procedures in the study of the world by an individual is a habit of mind that is also described as the capacity for questioning. Additionally, the scientific literacy scale's "systematic thinking/knowledge management" and "communication and cooperation" aspects are included in the habits of mind dimension. The reason for this was expressed as the fact that there is a need for individuals with problem-solving skills who can work in cooperation and communication due to the rapid scientific advancements that take place in the 21st century (Çelik, 2016). While cooperation skill is the capacity to work effectively and respectfully with various groups and carry out common duties, communication skill is the ability to effectively express opinions and ideas in different environments through written, verbal, or nonverbal communication skills, in addition to being a good listener (Trilling & Fadel, 2009). As a result, people with strong communication and cooperation skills may conduct group discussions, convey their ideas and opinions in a comfortable manner when evaluating scientific literature (such as textbooks, journals, articles, and texts), and appreciate the critical views of others. So it stands to reason that these people will read scientific texts with a more favorable perspective. According to Çelik (2016), the scientific literacy scale's systematic thinking/knowledge management factor aligns with the analytical thinking sub-learning area covered by the 2018 science course curriculum. Comparing two or more states, breaking a problem into manageable bits, articulating how you solved the problem, and criticizing and evaluating the characteristics of the target subject are all examples of analytical thinking (Sternberg, 2006). In a nutshell, analytical thinking emphasizes accessing, analyzing, and extrapolating relevant information from facts connected to a subject (Gürkaynak et al., 2008). As a result, people with strong systematic or analytical thinking skills may quickly find a scientific text that suits their needs, break the problem down into smaller parts, make sense of it, and draw helpful conclusions from it. Therefore, it may be assumed that these people will read such scientific writings with high regard. The other aspects of meta-cognition and self-direction (habits of mind, character and values, and science as a human endeavor) are seen to play a unifying function (Choi et al., 2011). Additionally, the capacity for metacognition and self-direction is crucial for an individual to govern his or her own cognition while also being in charge of behavior and learning states (Ulas et al., 2015). Learning requires metacognition, and those who are adept at it perform better academically and exhibit more strategic
thinking (Coutinho, 2007). In this way, metacognitive awareness empowers students to organize, track, and evaluate their own learning. Therefore, those students who take on their own duties during the learning process may do so in a way that makes it easier for them to apply what they have learned to the challenges they run into and thus succeed (Schraw & Dennison, 1994). While self-direction refers to a person's capacity to manage their own ideas, feelings, and behaviors (Ulaş et al., 2015). It has been noticed that people with strong self-control achieve greater success, build stronger bonds with their friends, and behave less aggressively (Tangney et al., 2004). Accordingly, it can be concluded that students who have high levels of metacognition and self-direction awareness (i.e., those who are conscious of their learning processes and have self-control over their actions) are better able to identify the main idea of scientific texts and engage in scientific discussions with their peers. Therefore, it can be said that these people may have more positive attitudes toward scientific texts than their contemporaries. On the basis of the discovered information, the following recommendations might be made:

1. The participants in the current study were aspiring primary school teachers. The association between the states of scientific literacy and attitudes toward reading scientific texts of science teachers can be researched using various approaches since the notions of scientific literacy and the favorable attitude toward reading scientific texts are significant for science teachers.

2. According to the survey, both the frequency of primary school teacher candidates' reading and their frequency of reading scientific texts is below average. It may be ensured that the faculty or university libraries are better equipped with regard to scientific texts and publications in order to increase the reading frequencies and the frequencies of reading scientific texts of teacher candidates.

3. Having reading materials with scientific content at home, reading aloud to one another, and discussing the texts they read may help children develop positive attitudes toward reading scientific texts, especially when it is taken into account that parents play a significant role in ensuring that the habit of reading is instilled in the children from an early age.

4. The faculty or university may organize events (reading days, seminars, briefings on scientific books, author interviews, etc.) to motivate teacher candidates to read more.

REFERENCES


Yeterişir, M. İ. (2007). İlköğretim fen bilgisi öğretmenliği ve sınıf öğretmenliği birinci sınıfta okuyan öğretmen adaylarının fen ve teknoloji okuryazarlık düzeyleri (Tez No. 207049) [Doktora Tezi, Gazi Üniversitesi. Ulusal Tez Merkezi].


An Investigation of Preschool Teacher Candidates’ Lifelong Learning Tendencies

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Abstract

This research aims to determine the preschool teacher candidates’ lifelong learning tendencies and preschool teacher candidates’ opinions about lifelong learning. The study group of this research is first, second, third and fourth grade students of preschool teaching in the primary school education department of a public university in Turkey. A mixed-method was used in this research. Data were gathered via the “Lifelong Learning Tendency Scale” which is developed by Diker-Coşkun and via the “Interview Form” which is developed by researchers. The lifelong learning tendency scale is applied to 362 students, and interviews are done with 27 students. Results show that the students’ lifelong tendencies are above the average point of the scale. There is no significant difference in lifelong learning tendencies between grade levels. There is a significant difference in lifelong learning tendencies between the different levels of academic success and whether or not students desire to get postgrad education.

Keywords: Lifelong Learning; Lifelong Learning Tendencies; Preschool Teacher Candidates

DOI: 10.29329/ijpe.2022.467.8

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INTRODUCTION

Individuals’ needs for science and learning, increase in correlation with their knowledge levels. It can be said that learning is a need that starts at birth and continues throughout life. Continuousness of learning is mentioned even in the times of ancient Greek. Plato said: ‘Learning starts when people are born and continues until the end of life’. This refers to the learning aspect of being lifelong. This shows that lifelong learning ideas existed in the B.C. era. Lately, this concept became more important and it is seen as a basic skill that every individual should develop. Lifelong learning starts at an early age as a way of fulfilling one’s needs and desires and continues throughout life as a tool for developing individuals (Oester & Oester, 1997). Lifelong learning increases individuals’ comprehensive abilities with the aid of surroundings and it enables individuals to catch up with the ever-increasing amount of information via using new technological ways to access information. Adams (2007) mentioned seven core factors that affect lifelong learning. These factors are:

- Organizational skills
- Communicative skills
- Research skills
- Ability to determine one’s own goals
- Being susceptible to change
- Social skills
- Literacy skills and technology literacy (Adams, 2007).

Demirel (2009) mentioned that people who will be successful should use technology efficiently, they should be able to solve problems and manage her own learning. Several efforts need to be done to become lifelong learning individuals. Longworth (2001) summarizes these efforts as follows:

- To have information about how individuals learn and their own learning styles,
- Mastering educational technologies and using them effectively,
- To know how to develop and use evaluation techniques and personal development modules,
- Using communication technologies effectively to provide innovative learning,
- Supporting studies that will strengthen communication between schools, communities and nations,
- Being a guide, for each learner to set his/her own goals, make his/her own learning plan and commence learning,
- To use regional, national and international resources to identify learning needs and evaluate learning opportunities to meet these needs,
- Researching and using new learning techniques,
Motivating individuals and providing self-confidence by making learning a fun and creative experience.

Although the skills and practices mentioned above are important for all professions, they have a special place and importance in the teaching profession. Because lifelong learning teachers are defined as teachers who can follow technological developments and perform effective teaching in the information age (European Commission, 1997). Coolahan (2002) also talks about the characteristics of the teacher required for the students of today and tomorrow and states that the teacher should understand herself/himself and the nature of her/his studies in depth. And also emphasizes that teachers must have developed a wide range of professional skills in teaching, planning, assessment and personal relationships, have the flexibility and be open to self-renewal and lifelong learning (Coolahan, 2002). In addition, it is thought that teachers with lifelong learning skills can contribute to their students’ lifelong learning as well as their own development (Yildirim, Genc & Eryaman, 2016).

For this reason, it has been deemed necessary to examine the lifelong learning skills of preschool teacher candidates, where the students left their families for the first time and met a different environment. In this context, this research aims to determine the lifelong learning tendencies of preschool teacher candidates. For this purpose, answers to the following questions were sought:

1. What are the lifelong learning tendencies of preschool teacher candidates?
2. What are the opinions of preschool teacher candidates about lifelong learning?
3. Do preschool teacher candidates’ lifelong learning tendencies differ significantly according to grade level?
4. Do preschool teacher candidates’ lifelong learning tendencies differ according to academic success?
5. Do the preschool teacher candidates’ lifelong learning tendencies differ according to their desire to pursue postgraduate education?

**METHOD**

**Research model**

In this study, where preschool teacher candidates’ lifelong learning tendencies were examined, qualitative and quantitative data collection techniques and analyses were used together and interpreted together. Therefore, the method used in the research was a mixed method. Creswell (2003) defines the mixed method as a research approach in which quantitative and qualitative data are integrated and then the results are drawn by using the advantages of integrating these two data sets. In the quantitative stage of the mixed method, where the pre-service teacher candidates' lifelong learning tendencies were examined, the screening method was used because the current situation was tried to be described. A screening method is a research approach that aims to describe a situation that exists in the past or still as it exists (Karasar, 2009). At the qualitative stage of the research, semi-structured interviews were conducted with preschool teacher candidates.

**Research group**

The study group of the research consisted of teacher candidates studying in the first, second, third and fourth grade in a public university, Faculty of Education, Department of Basic Education, Preschool Division in Turkey. A total of 362 teacher candidates participated in the study.
Data gathering tools

The data of the research were collected by using the ‘Lifelong Learning Tendencies Scale’ and ‘Interview Form’. The ‘Lifelong Learning Tendencies Scale’ developed by Diker Coşkun (2009) is a five-point Likert-type scale developed to measure university students’ lifelong learning tendencies. The 74-item form of the scale was shaped in line with expert opinions, and its correlation with the ‘Curiosity Index’ scale, which is known to measure the same scope, was examined. This value has been calculated as 76. The trial form of the scale was administered to 642 students who are educated in seven different faculties and departments of the university in Turkey. The data obtained were subjected to exploratory factor analysis and it was determined that the scale consists of four sub-dimensions: motivation, persistence, lack of regulation in learning, and lack of curiosity. The total reliability of the scale for the final form consisting of 27 items was determined as 89 (Diker Coşkun, 2009). The reliability of the “Lifelong Learning Tendencies Scale” calculated after the application in this study was calculated at .92. The questions of the semi-structured interview form, which is another measurement tool used in the research, were prepared and arranged in line with the opinions of the experts and they were finalized by conducting a pre-interview with the three preschool teacher candidates. The questions in the interview form have been prepared in a way to provide in-depth information about the lifelong learning tendencies of teacher candidates. Focus group interviews were conducted with 27 teacher candidates selected from the group where the scale was applied. These candidates were selected via convenience sampling which is a purposive sampling method. It is aimed to get in-depth information about the questions on the scale with the interview questions.

Analysis of the data

Descriptive statistics were calculated using SPSS 24 in the study; for independent samples t-test, one-way ANOVA and Bonferroni tests were done. The data obtained from the interviews were first converted into plain text, and then the data was coded and how often the information was repeated get determined. The data obtained from the interviews were analyzed separately by two researchers. To establish reliability among the researchers, the percentage of compatibility between coding was calculated. This was calculated via a percentage of compatibility suggested by Miles and Huberman (1984), compatibility value was calculated at .84. Interview data were analyzed using the descriptive analysis method and presented with direct quotations.

FINDINGS

Findings regarding the levels of lifelong learning tendencies of preschool teacher candidates

Descriptive statistics related to the lifelong learning tendencies of preschool teacher candidates are shown in Table 1.

Table 1. Arithmetic means and standard deviations of students’ lifelong learning tendency scores.

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Lowest</th>
<th>Highest</th>
<th>$\bar{x}$</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale total</td>
<td>362</td>
<td>41</td>
<td>162</td>
<td>128.78</td>
<td>20.13</td>
</tr>
<tr>
<td>1st Subdimension: Motivation</td>
<td>362</td>
<td>7</td>
<td>36</td>
<td>31.29</td>
<td>4.07</td>
</tr>
<tr>
<td>Perseverance</td>
<td>362</td>
<td>7</td>
<td>36</td>
<td>27.49</td>
<td>5.36</td>
</tr>
<tr>
<td>3rd Subdimension: Lack of Regulating Learning</td>
<td>362</td>
<td>7</td>
<td>36</td>
<td>29.35</td>
<td>6.34</td>
</tr>
<tr>
<td>4th Subdimension: Lack of Curiosity</td>
<td>362</td>
<td>13</td>
<td>54</td>
<td>40.65</td>
<td>10.21</td>
</tr>
</tbody>
</table>

When Table 1 is analyzed, it can be seen that the preschool teacher candidates’ lowest score on the scale of lifelong learning tendencies is 41 points and the highest is 162 points. The scale average is calculated as 128.78. It is observed that the arithmetic averages of teacher candidates regarding lifelong learning tendencies are above the mean score of the scale (27x3.5=94.5). When the statistics related to the sub-dimensions of the scale are examined; the motivation dimension is 31.29;
perseverance is 27.49; lack of regulating learning dimension has an average of 29.35 and the lack of curiosity dimension has an average of 40.65. When the average scores of the dimensions are calculated, the motivation dimension is 21 (6x3.5); the size of perseverance is 21 (6x3.5); It was determined that the lack of regulating learning dimension was 21 (6x3.5) and the lack of curiosity dimension is 31 (9x3.5) in the regulation of learning. Accordingly, the preschool teacher candidates’ scores from the dimensions of the scale are above the average scores. The distribution of teacher candidates’ answers is shown in Table 2.

### Table 2. Distribution of answers to the ‘Lifelong Learning Tendencies Scale’

<table>
<thead>
<tr>
<th>Item No</th>
<th>Very Suitable</th>
<th>Partly Suitable</th>
<th>Very Slightly Suitable</th>
<th>Very Slightly not Suitable</th>
<th>Partly is not Suitable</th>
<th>Not Suitable</th>
<th>( \bar{x} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>188 51.9</td>
<td>137 37.8</td>
<td>27 7.5</td>
<td>5 1.4</td>
<td>3 0.8</td>
<td>2 0.6</td>
<td>5.37</td>
</tr>
<tr>
<td>2</td>
<td>228 63.0</td>
<td>110 30.4</td>
<td>16 4.4</td>
<td>4 1.1</td>
<td>2 0.6</td>
<td>2 0.6</td>
<td>5.52</td>
</tr>
<tr>
<td>3</td>
<td>149 41.2</td>
<td>143 39.5</td>
<td>57 15.7</td>
<td>5 1.4</td>
<td>6 1.7</td>
<td>2 0.6</td>
<td>5.15</td>
</tr>
<tr>
<td>4</td>
<td>206 56.9</td>
<td>103 28.5</td>
<td>42 11.6</td>
<td>5 1.4</td>
<td>3 0.8</td>
<td>3 0.8</td>
<td>5.37</td>
</tr>
<tr>
<td>5</td>
<td>135 37.3</td>
<td>153 42.3</td>
<td>55 15.2</td>
<td>11 3.0</td>
<td>7 1.9</td>
<td>1 0.3</td>
<td>5.09</td>
</tr>
<tr>
<td>6</td>
<td>84 23.2</td>
<td>164 45.5</td>
<td>86 23.8</td>
<td>14 3.9</td>
<td>7 1.9</td>
<td>1 0.3</td>
<td>4.78</td>
</tr>
<tr>
<td>7</td>
<td>52 14.4</td>
<td>142 39.2</td>
<td>100 27.6</td>
<td>39 10.8</td>
<td>19 5.2</td>
<td>10 2.8</td>
<td>4.38</td>
</tr>
<tr>
<td>8</td>
<td>54 14.9</td>
<td>136 37.6</td>
<td>106 29.3</td>
<td>39 10.8</td>
<td>19 5.2</td>
<td>8 2.2</td>
<td>4.40</td>
</tr>
<tr>
<td>9</td>
<td>67 18.5</td>
<td>126 34.8</td>
<td>95 26.2</td>
<td>40 11.0</td>
<td>15 4.1</td>
<td>19 5.2</td>
<td>4.37</td>
</tr>
<tr>
<td>10</td>
<td>117 32.3</td>
<td>143 39.5</td>
<td>65 18.0</td>
<td>19 5.2</td>
<td>16 4.4</td>
<td>2 0.6</td>
<td>4.88</td>
</tr>
<tr>
<td>11</td>
<td>80 22.1</td>
<td>148 40.9</td>
<td>78 21.5</td>
<td>27 7.5</td>
<td>23 6.4</td>
<td>6 1.7</td>
<td>4.60</td>
</tr>
<tr>
<td>12</td>
<td>124 34.3</td>
<td>124 24.3</td>
<td>80 22.1</td>
<td>17 4.7</td>
<td>9 2.5</td>
<td>8 2.2</td>
<td>4.86</td>
</tr>
<tr>
<td>13</td>
<td>170 47.0</td>
<td>50 13.8</td>
<td>33 9.1</td>
<td>33 9.1</td>
<td>36 9.9</td>
<td>40 11.0</td>
<td>4.46</td>
</tr>
<tr>
<td>14</td>
<td>191 52.8</td>
<td>58 16.0</td>
<td>32 8.8</td>
<td>38 10.5</td>
<td>30 8.3</td>
<td>13 3.6</td>
<td>4.84</td>
</tr>
<tr>
<td>15</td>
<td>233 64.4</td>
<td>48 13.3</td>
<td>25 6.9</td>
<td>28 7.7</td>
<td>19 5.2</td>
<td>9 2.5</td>
<td>5.16</td>
</tr>
<tr>
<td>16</td>
<td>242 66.9</td>
<td>46 12.7</td>
<td>20 5.5</td>
<td>29 8.0</td>
<td>14 3.9</td>
<td>11 3.0</td>
<td>5.22</td>
</tr>
<tr>
<td>17</td>
<td>165 45.6</td>
<td>79 21.8</td>
<td>33 9.1</td>
<td>48 13.3</td>
<td>25 6.9</td>
<td>12 3.3</td>
<td>4.76</td>
</tr>
<tr>
<td>18</td>
<td>185 51.1</td>
<td>76 21.0</td>
<td>30 8.3</td>
<td>40 11.0</td>
<td>19 5.2</td>
<td>12 3.3</td>
<td>4.92</td>
</tr>
<tr>
<td>19</td>
<td>138 38.1</td>
<td>78 21.5</td>
<td>52 14.4</td>
<td>43 11.9</td>
<td>31 8.6</td>
<td>20 5.5</td>
<td>4.52</td>
</tr>
<tr>
<td>20</td>
<td>52 14.4</td>
<td>92 25.4</td>
<td>54 14.9</td>
<td>84 23.2</td>
<td>49 13.5</td>
<td>31 8.6</td>
<td>3.78</td>
</tr>
<tr>
<td>21</td>
<td>116 32.0</td>
<td>83 22.9</td>
<td>42 11.6</td>
<td>61 16.9</td>
<td>40 11.0</td>
<td>20 5.5</td>
<td>4.31</td>
</tr>
<tr>
<td>22</td>
<td>199 55.0</td>
<td>57 15.7</td>
<td>33 9.1</td>
<td>35 9.7</td>
<td>26 7.2</td>
<td>12 3.3</td>
<td>4.92</td>
</tr>
<tr>
<td>23</td>
<td>238 65.7</td>
<td>53 14.6</td>
<td>19 5.2</td>
<td>21 5.8</td>
<td>26 6.6</td>
<td>7 1.9</td>
<td>5.21</td>
</tr>
<tr>
<td>24</td>
<td>230 63.5</td>
<td>42 11.9</td>
<td>26 7.2</td>
<td>30 8.3</td>
<td>19 5.2</td>
<td>14 3.9</td>
<td>5.09</td>
</tr>
<tr>
<td>25</td>
<td>78 21.5</td>
<td>92 25.4</td>
<td>52 14.4</td>
<td>50 13.8</td>
<td>57 15.7</td>
<td>33 9.1</td>
<td>3.96</td>
</tr>
<tr>
<td>26</td>
<td>98 27.1</td>
<td>90 24.9</td>
<td>44 12.2</td>
<td>64 17.7</td>
<td>37 10.2</td>
<td>29 8.0</td>
<td>4.17</td>
</tr>
<tr>
<td>27</td>
<td>191 52.8</td>
<td>52 14.4</td>
<td>20 5.5</td>
<td>42 11.6</td>
<td>28 7.7</td>
<td>29 8.0</td>
<td>4.69</td>
</tr>
</tbody>
</table>

When Table 2 is analyzed, it can be seen that the averages of lifelong learning tendencies of preschool teacher candidates are generally high. The items that the teacher candidates have the highest average are ‘I can learn all kinds of information easily if I believe that they will provide my personal development’ (i2; 5.52) and ‘It is suitable for me to develop new and skills and to learn new information in different fields to improve myself’ (i1; 5.37). The item with the lowest average on the scale is (i20) ‘I prefer to spend the time I spend for my personal development with my loved ones’ (3.78) and ‘I prefer to spend time to do my hobbies instead of making efforts to learn new things except for compulsory situations’ (i20; 3.96).

**Findings regarding the preschool teacher candidates’ views on lifelong learning**

The questions regarding the opinions of preschool teacher candidates on lifelong learning have been prepared by the items in the scale to provide clues about the preschool teachers’ lifelong learning tendencies. Accordingly, four questions were prepared. The first question was ‘What are your opinions on learning new information?’ and the analysis of this question is presented in Table 3.
When Table 3 is analyzed, it can be said that preschool teacher candidates stated that learning new information motivates them to be lifelong learners (24.14%). This is followed by the view that learning new information will benefit them and ensure their development (20.69%). The view that learning new information enables one to discover life and stimulates curiosity is among the answers of teacher candidates (13.79%). Finally, preschool teacher candidates state that learning new information makes the individual happy (6.90%). These opinions of teacher candidates are given below:

Learning is a lifelong process, as we all heard and know. We cannot limit learning only to schools. Our life is the most important learning environment for us (k8) (Motivation about lifelong learning).

I think it is necessary to learn new information because it is necessary for human development, especially for cognitive development. (k1) (Ensuring the development of the individual).

Learning new information allows me to understand that I am involved in life and that I am still living. Learning every new information makes me feel more ready for life. I have the opportunity to use it somewhere in my life. Anyway, I do not think as this is not my field this information will not be useful. (k13) (Accessing information that will benefit the individual)

Another question is, ‘Do you think learning is important and how much do you include learning in your life?’ Here, all preschool teacher candidates state that learning is important. Their answers regarding how much they have included learning in their lives are presented in Table 4.

More than half of the pre-school teacher candidates stated that they include learning in every moment of their lives (59.26%). The remaining part states that they include learning in most of their lives (33.33%) and half of their lives are spent with learning (7.41%). The opinions of teacher candidates on this subject are given below:

Of course, learning is as important as humans’ basic needs. I find it important to learn at every moment of my life. From birth, people improve themselves with continuous learning. As a requirement of my profession, I have to constantly improve myself to provide more efficient attainment to myself and my students. For this, I need to read psychology books, guide books and child development books and teach the information I get to my students (k12) (At every moment of life)

Yes, learning is very important. I include learning for most of my life. Each person learns very useful information from another person, regardless of age and experience (k19) (in the vast majority of life)

### Table 3. Descriptive statistics related to teacher candidates’ opinions on learning new information

<table>
<thead>
<tr>
<th>Categories</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivating the individual to be a lifelong learner</td>
<td>7</td>
</tr>
<tr>
<td>Enabling the individual to access information that will be useful</td>
<td>6</td>
</tr>
<tr>
<td>Ensuring the development of the individual</td>
<td>6</td>
</tr>
<tr>
<td>Enabling the discovery of life</td>
<td>4</td>
</tr>
<tr>
<td>Stimulating a sense of wonder</td>
<td>4</td>
</tr>
<tr>
<td>Making the individual happy</td>
<td>2</td>
</tr>
</tbody>
</table>

### Table 4. Descriptive statistics of teacher candidates’ inclusion levels of learning in their lives

<table>
<thead>
<tr>
<th>Categories</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every moment of life</td>
<td>16</td>
</tr>
<tr>
<td>In the vast majority of life</td>
<td>9</td>
</tr>
<tr>
<td>In the half of life</td>
<td>2</td>
</tr>
</tbody>
</table>
Learning is of course very important, especially in the age we are in the information is constantly updated and changing. Therefore, we must constantly update our information. Half of my life is learning new things (k1) (Half of life)

Another question addressed to preschool teacher candidates is ‘When trying to learn a topic you like/are interested in, does the difficulty level prevent you to stop? Or do you continually try to learn this information? How? Does the situation change when the topic is something that you do not like?’ 26 of the preschool teacher candidates stated that they did not give up, no matter how hard it was when they liked the topic. Findings about the answers they gave regarding the disliked topics are given in Table 5.

Table 5. Descriptive statistics on teacher candidates’ opinions on learning the topics they do not like

<table>
<thead>
<tr>
<th>Categories</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Searching for new ways to make individuals like the subject</td>
<td>11</td>
</tr>
<tr>
<td>Being persistent in learning regardless of challenges</td>
<td>10</td>
</tr>
<tr>
<td>Giving up learning</td>
<td>5</td>
</tr>
</tbody>
</table>

Nearly half of preschool teacher candidates stated that whenever there is a topic that they do not like, they search for new ways to love it and motivate themselves and do not give up learning (42,31%). The number of teacher candidates who stated that they did not give up learning and persevered in learning regardless of the subject was also quite high (38,46%). Five of the preschool teacher candidates stated that they gave up learning and gave up when there was an issue they did not like (19,23%). The opinions of teacher candidates on this subject are given below:

If I encounter a challenge in learning information about a topic that I like, this challenge motivates me to keep trying. I am looking for ways to love it if the subject is something that I don’t like (k2) (Searching for learning new ways that can make the subject love)

If a topic that I like challenges me, I will not stop learning. Yes, it can reduce my motivation to study for a while, but I can make it easier to learn by asking someone who has already experienced or learned the information. I can try to solve the situation that I have difficulty with by researching from the books, the Internet, etc. The situation does not change a topic is something that I do not like. We never know how much the things we learned will impact somewhere in our lives. Therefore, I do not think that should lose motivation by separating information as we like or dislike (k17) (Being persistent in learning regardless of challenges)

Yes, I can give up because I don't enjoy learning when there is a topic that I dislike (k14) (Giving up learning)

‘How important is it for you to learn new information about your profession?’ All of the teacher candidates answered the question as very important. The findings about their learning on this subject are presented in Table 6.

Table 6. Descriptive statistics on teacher candidates’ learning in professional subjects

<table>
<thead>
<tr>
<th>Categories</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researching (article, current publications, books, etc.)</td>
<td>12</td>
</tr>
<tr>
<td>Consulting with experienced people/getting help from them</td>
<td>10</td>
</tr>
<tr>
<td>Keeping up with social media/Internet</td>
<td>4</td>
</tr>
<tr>
<td>Going courses</td>
<td>4</td>
</tr>
<tr>
<td>Attending congresses/seminars</td>
<td>4</td>
</tr>
<tr>
<td>Observing/internships</td>
<td>3</td>
</tr>
<tr>
<td>Exchanging information with friends</td>
<td>2</td>
</tr>
<tr>
<td>Learning by doing/learning from students</td>
<td>2</td>
</tr>
</tbody>
</table>
When Table 6 is examined, it can be seen that the most preferred way for preschool teacher candidates to learn professional topics is to research, that is, the research articles, current books and innovations (29.27%). This is followed by consulting experienced people (preschool teachers, academicians, etc.) and getting help from them (24.39%). Following professional issues on social media/internet, attending courses, and attending congresses/seminars are among the preferred learning pathways for teacher candidates (9.76%). While three preschool teacher candidates (7.32%) stated that they learned professional subjects through internships and observations; two preschool teacher candidates stated that they preferred to learn by exchanging information with their friends and practicing their profession (4.88%).

I think it is important to learn new information and new things before school because this period is a critical period for children, we need to transfer them to the right method in the right way we should research it. I constantly read the works in the field, besides, I follow the magazines constantly (k9) (Researching).

Learning new information about my profession is vitally important. Because as a teacher, as I will raise a new generation in a constantly renewed and changing life, I have to keep my mind fresh and alive to bring them to the best and the best. To learn new information, I can go to courses, use published academic articles, get help from my university professors or learn with my students. I am not going to be competent in all matters. They can teach me because their minds are fresher. I can realize the mutual learning-teaching process (k5)

Findings Regarding Investigation of Lifelong Learning Tendencies According to Grade Level

The data on the distribution of the average preschool teacher candidates’ lifelong learning tendencies according to grade level are given in Table 7.

Table 7. Arithmetic means and standard deviations of teacher candidates’ lifelong learning tendencies by grade level

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>n</th>
<th>X</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Grade</td>
<td>49</td>
<td>126.57</td>
<td>22.22</td>
</tr>
<tr>
<td>Second Grade</td>
<td>106</td>
<td>128.68</td>
<td>20.65</td>
</tr>
<tr>
<td>Third Grade</td>
<td>134</td>
<td>129.61</td>
<td>18.05</td>
</tr>
<tr>
<td>Fourth Grade</td>
<td>74</td>
<td>128.90</td>
<td>21.79</td>
</tr>
<tr>
<td>Total</td>
<td>362</td>
<td>128.78</td>
<td>20.13</td>
</tr>
</tbody>
</table>

When Table 7 is examined, it can be seen that the scores of teacher candidates on lifelong learning tendencies belong to the lowest first-year students (126.57); it is observed that the second grade follows (128.68) and the highest average belongs to third-grade students (129.61). ANOVA results are given in Table 8 to reveal whether there is a significant difference between grade levels.

Table 8. ANOVA results on lifelong learning tendencies by grade level

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>333.72</td>
<td>3</td>
<td>111.24</td>
<td>0.273</td>
<td>.0845</td>
</tr>
<tr>
<td>Within groups</td>
<td>146000.04</td>
<td>358</td>
<td>407.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>146333.76</td>
<td>361</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p&lt;0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the table is examined, it can be seen that the preschool teacher candidates’ lifelong learning tendencies do not change according to the grade level.
Findings Regarding Investigation of Lifelong Learning Tendencies According to Academic Success

The data on the distribution of the averages regarding preschool teacher candidates’ lifelong learning tendencies in terms of academic success are given in Table 9.

Table 9. Arithmetic means and standard deviations of teacher candidates’ lifelong learning tendencies by academic success

<table>
<thead>
<tr>
<th>Academic Success Level</th>
<th>n</th>
<th>( \bar{X} )</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2.49</td>
<td>48</td>
<td>114.13</td>
<td>21.97</td>
</tr>
<tr>
<td>2.50-2.99</td>
<td>159</td>
<td>127.62</td>
<td>19.92</td>
</tr>
<tr>
<td>3.00 and above</td>
<td>155</td>
<td>134.52</td>
<td>17.15</td>
</tr>
<tr>
<td>Total</td>
<td>362</td>
<td>128.78</td>
<td>20.13</td>
</tr>
</tbody>
</table>

When the table is examined, it can be seen that the scores of teacher candidates regarding lifelong learning tendencies belong to the students with the lowest grade average of 0-2.49 (114.13); it can be seen that the average of 2.50-2.99 is followed by (127.62) and the highest average belongs to students with an average of 3.00 and above (134.52). ANOVA results are given in Table 10 to reveal whether there is a significant difference between the academic success levels.

Table 10. ANOVA results on lifelong learning tendencies by academic success

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>15624.20</td>
<td>2</td>
<td>7812.10</td>
<td>21.46</td>
<td>0.000</td>
</tr>
<tr>
<td>Within groups</td>
<td>130709.56</td>
<td>359</td>
<td>362.09</td>
<td></td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Total</td>
<td>146333.76</td>
<td>361</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to table 10, the lifelong learning tendencies of preschool teacher candidates show a significant difference in terms of academic success. Bonferroni test was done to determine where this difference originated. The results are given in Table 11.

Table 11. Group comparisons of lifelong learning tendencies by academic success

<table>
<thead>
<tr>
<th>Groups</th>
<th>Differences in mean scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2.49</td>
<td>2.50-2.99</td>
</tr>
<tr>
<td>2.50-2.99</td>
<td>3.00 and above</td>
</tr>
<tr>
<td>0-2.49</td>
<td>13.49*</td>
</tr>
<tr>
<td>3.00 and above</td>
<td>6.90*</td>
</tr>
<tr>
<td>0-2.49</td>
<td>20.39*</td>
</tr>
<tr>
<td>2.50-2.99</td>
<td>13.49*</td>
</tr>
</tbody>
</table>

When Table 11 is analyzed, it can be seen that the scores of preschool teacher candidates with a grade average of 3.00 and above differ significantly from the group with an average of 0-2.49 and 2.50-2.99. In addition, it is revealed that the preschool teacher candidates’ lifelong learning tendencies with a grade average of 2.50-2.99 are significantly higher than the teacher candidates with an average of 0-2.49. Accordingly, it is determined that preschool teacher candidates who have high academic success levels have significantly higher lifelong learning tendencies scores.

Findings Regarding Investigation of Lifelong Learning Tendencies in According to Will to Pursue a Post Graduate Degree

The results of the t-test analysis conducted to reveal whether the lifelong learning tendencies of preschool teacher candidates change according to the will to pursue a post-graduate degree are given in Table 12.
Table 12. Independent groups t-test statistics of lifelong learning tendencies according to having a will to pursue a post-graduate degree

<table>
<thead>
<tr>
<th>Will to pursue graduate education</th>
<th>N</th>
<th>X</th>
<th>sd</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>196</td>
<td>133.30</td>
<td>18.91</td>
<td>1.35</td>
<td>4.78</td>
<td>0.00</td>
</tr>
<tr>
<td>No</td>
<td>166</td>
<td>123.45</td>
<td>20.28</td>
<td>1.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05

When Table 12 is analyzed, it can be seen that the lifelong learning tendencies of preschool teacher candidates differ significantly according to their will to pursue a post-graduate degree. The lifelong learning tendencies of preschool teacher candidates who have a will to pursue a post-graduate degree are significantly higher than those who will not pursue a post-graduate degree.

CONCLUSION DISCUSSION AND SUGGESTIONS

The purpose of this research is to determine the lifelong learning tendencies of preschool teacher candidates. When the results of the research are analyzed, it was found that the arithmetic mean of the teacher candidates about lifelong learning tendencies is above the scale average score. Thus, it can be stated that preschool teacher candidates have a high lifelong learning tendency. In addition, it was determined that the scores related to the sub-dimensions of the scale were above the average scores. When the answers of preschool teacher candidates to the items in the scale are examined individually, it can be seen that the average of lifelong learning tendencies is generally high. When studies conducted with teachers, administrators, teacher candidates and university students are examined, similar results can be seen (Allan, 1980; Boztepe & Demirtaş, 2018; Demirel & Akkoyunlu, 2017; Kozikoğlu & Altunova, 2018; Nguyen, 2011; Özgür, 2016). The reason why preschool teacher candidates have a high lifelong learning tendency may be related to the reason that teachers think that they should always improve themselves. Teaching points out the necessity of being open to continuous development and change in terms of profession, and always requires learning (Day, 1999; Selvi, 2010). Accordingly, it can be said that a qualified teacher is a lifelong learning teacher who is always open to learning.

It has been revealed that the items with the highest averages of preschool teacher candidates on lifelong learning tendencies are ‘I can learn all kinds of information easily if I believe that they will contribute to my personal development and ‘It is exactly for me to develop new skills and learn new information in different areas to improve myself’. Accordingly, it can be said that teacher candidates are always open to learning for their own development and they are eager to develop new skills and learn new information. In the interviews conducted with preschool teacher candidates, it was concluded that the access to the new information contributed to their development and motivated them to be lifelong learners. The topic of teacher candidates learning all kinds of information that will contribute to their personal development is similar to the interview data. While the teacher candidates stated that they would not give up learning about a topic they love, they stated that if they have to learn about a topic that they do not like, they will try to find new ways to like it and they with this they would not quit on it. In addition, they stated that it is very important for them to develop themselves professionally and that they have contributed to these developments in many different ways (doing research, getting help from experienced people, following the developments related to their profession in social media, etc.). When the literature is examined, it can be seen that these results are supported (Ayaz, 2016; Bulaç & Kurt, 2019; Demirel & Yağcı, 2012). In the light of all these results, it can be said that preschool teacher candidates who participated in the research found it very important to learn new information about their personal and professional development, and they followed different paths in this regard, and this motivated them for lifelong learning.

The items with the lowest average on the scale are ‘I prefer to spend the time I spend for my personal development with my loved ones.’ and ‘I prefer to spend the time with my hobbies, rather than making an effort to learn new things except for compulsory situations’. These are also consistent with the interview data. The vast majority of preschool teacher candidates stated that they are learning in every moment of their lives. In addition, they accepted learning new knowledge affects them
positively and expressed that learning motivates them to be lifelong learners. It also contributes to their discovery of life and makes them happy by arousing curiosity. When the literature is examined, it can be seen that these results are supported (Ayaz, 2016; Ayra & Kösterelioğlu, 2015; Rempel, 2010). According to these results, it can be stated that the teacher candidates are always open to learning and they have a positive opinion about learning new information.

It has been determined that the lifelong learning tendencies of preschool teacher candidates increase as the grade level increases, but they do not differ significantly. Accordingly, it can be said that the lifelong learning tendencies of preschool teacher candidates do not differ according to the grade level. When the literature is examined, it can be seen that there are studies supporting this result (Akcaalan, 2016; Yurdakul, 2017). The reason why there is no difference in lifelong learning tendencies in terms of grade level may be because lifelong learning is not completely dependent on formal education and it is related to individual characteristics. However, it seems to be very important to reinforce these skills with education at school. According to this, although lifelong learning tendency is related to the self-development of the individual, it is considered very critical to develop in pre-service education, especially for teachers (Coolahan, 2002).

It has been determined that the preschool teacher candidates’ lifelong learning tendencies increase as their academic success increases and this increase is significant. Thus, it can be said that preschool teacher candidates who are more successful academically have higher lifelong learning tendencies. When the literature is examined, it can be seen that these results are supported (Akcaalan, 2016, Diker-Coşkun, 2009). Lifelong learning teachers can be seen as individuals who see learning as a need and can determine their own learning needs, see themselves as always open to learning, are learning new information for a great part of their lives and benefit from different ways in this process. These skills are known to be associated with academic success. Subaş (2000) demonstrated that efficient study methods such as determining their priorities, planning by analyzing time, utilizing different learning strategies and managing their work increase academic success. This result explains preschool teacher candidates have a lifelong learning tendency and also have high academic success.

It has been determined that the preschool teacher candidates’ lifelong learning tendencies differ significantly according to their desire to pursue postgraduate education. Accordingly, it was concluded that preschool teacher candidates who want to pursue postgraduate education have a significantly higher lifelong learning tendency. When the literature is examined, it is revealed that the desire to pursue postgraduate education makes a significant difference in terms of lifelong learning of students and teacher candidates (Demirel & Akkoyunlu, 2017; Diker-Coşkun & Demirel, 2012; Kozikoğlu, 2014). It is thought that individuals who want to do postgraduate studies have a positive attitude towards research and learning (Diker-Coşkun, 2009). Also, postgraduate education enables individuals to progress in their field, gain in-depth knowledge, sustain their education and improve themselves. In addition, it can be stated that individuals who want to pursue postgraduate education are individuals who are motivated about learning. In the study of Saracaçoğlu (2008), it was concluded that students who are enrolled in a postgraduate education curriculum had an ‘adequate’ level of academic motivation. These results explain the reason why individuals who want postgraduate education have high lifelong learning tendencies.

In line with the results of the research, although preschool teacher candidates were found to have a high lifelong learning tendency, it is noticeable that there is no significant difference according to the grade level. Accordingly, it is thought that it is important to include activities that will contribute to lifelong learning in undergraduate programs to contribute preschool teacher candidates to be lifelong learners. In addition, preschool teacher candidates who are willing to pursue postgraduate education have higher lifelong learning tendencies. In this case, it may be suggested that preschool teacher candidates should be informed about postgraduate education and be directed and they should be guided in this regard, considering that this will contribute to being a lifelong learner. This research was carried out with preschool teacher candidates studying in the field of preschool education at universities at the department of education. It may be suggested to conduct the study with different universities and make comparisons between universities. In addition, by conducting experimental
studies on activities that can be applied to improve the lifelong learning tendencies of preschool teacher candidates, clues about the applications that can be done in undergraduate curricula can be presented.

REFERENCES


Socialization: The Process of Learning to be Human

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Abstract

Socialization is the process of learning to be a human being that is born with the potential to be human. In this process, the person learns the basic values and norms of the society in which he lives, as well as the skills necessary to sustain his life. This learning takes place through parents, siblings, relatives, neighbors, peers, teachers, and other people with whom the person interacts, although their levels of influence may differ. The transformation of a baby into a human depends on being given the opportunity to live in a human community and learn to be human. As a result of research on children like Victor, Kamala, Shamdev who were abandoned in the forest and isolated at home like Isabella, Anna, Genie and Danielle, it has been observed that individuals who were deprived of the opportunity to learn to be human could not speak, make strange sounds, lack human feelings, and could not fully perform even simple physical activities such as sitting, standing and walking on two legs. More interestingly, efforts to humanize these people have not been successful enough, with the exception of Isabella. Similar results have emerged in studies conducted on children living in orphanages in different countries of the world, especially in Romania, in case the interaction is not humane, it has been seen that it is not enough to meet the basic needs of children such as food, drink and shelter.

Keywords: Socialization, Feral Children, Romanian Orphanages

DOI: 10.29329/ijpe.2022.467.9

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INTRODUCTION

Every human being is born twice. The first is biological birth. After this birth, the baby is like a kitten, a puppy. He is even more helpless than them. His helplessness is so evident that he cannot even move from his place unless someone takes him in his arms and carries him from one place to another. He has to wait until his infancy, when he has to use his hands, even for such mundane behavior as being able to move on his own. In the same way, it takes a long time for him to say that he needs a toilet. During this time, he pees and poops whenever he wants and wherever he wants. Moreover, while doing these behaviors, he does not have to worry about what anyone will think. It makes strange sounds until it learns to speak, which is one of the most important indicators of being human. This helpless and powerless being, who is absolutely dependent on others in order to survive, turns into an individual who is a part of society and culture over time. This transformation is almost a new birth. This situation, which can be called sociological birth, takes place thanks to the process we call socialization (Thio, 1989).

There is a saying attributed to Socrates: “Horses are born horses, but humans are not born human.” Indeed, shortly after a horse is born, it gets up and starts behaving like a horse. The same is true for a duckling or gosling. After hatching, these chicks can easily swim in a pond without any danger of drowning by following their mothers without being subjected to any training. Not only horses, ducks or geese, but almost all animals can display the average behavior of their own species for a while after they are born. Therefore, it would be more correct to take the “horse” mentioned in Socrates’ word as a symbol that also represents other animals. While this is the case with animals, the same is not true for humans. It is no exaggeration to say that while animals come into the world almost fully, humans are incomplete beings that need to be completed. Although we are born in human form, we actually learn to be human through a long and difficult socialization process that starts with the first person we interact with when we are born, and continues until the end of our lives.

Being truly human depends on being able to go beyond his biological existence and having some human values. In any case, when valuing people, we take into account their level of possession of these values, not their biological existence. When we meet someone who has not gone beyond their biological existence and is far from human values, we use expressions as “you were not a man”, “you did not have your share of humanity”, “you were not a man of your own mold”, “I thought you were a man.” We also use expressions such as “he must have escaped from the zoo” for those who exhibit rude behavior. None of the discomforts expressed in these expressions have a meaning related to the biological existence of the addressee. Rather, it implies that he is a person who has not achieved completion, has not gone beyond being a biological organism. Expressions such as “manly man”, “where a man is a man, a woman is always a lady” also contain meanings not related to the biological existence of the interlocutor, but to the level of humanity.

In this study, it is tried to show that socialization is so important that it deserves to be named as the second birth, based on the children who were abandoned in the forest, kept in isolation in their homes and raised in orphanages away from their family environment.

What is Socialization

So, what is socialization that has such an important place in our lives? Socialization is a process in which the cultural heritage of the society is transferred to individuals. Thanks to socialization, the child develops his personality and learns to be human in one way (Thio, 1989). Near the people who have an important place in their lives such as parents, siblings, grandparents, aunts, uncles, cousins, friends and teachers, children are socialized by the society they live in as a whole. These socialization agents apply different methods for children to behave, think and feel in accordance with social values and norms. All these intermediaries also learned social values and norms in a similar socialization process they experienced (Berns, 1997). Socialization is education in its broadest sense: it is a process by which a person gains a sense of identity and learns what people around him believe and how they expect him to behave. In this process, the person encounters clear
instructions about what to do and what not to do. A helpless baby gradually develops into an individual who gains knowledge and cooperates with other members of society through socialization. Through socialization, individuals not only learn the norms and values that dominate their culture, but also gain an idea of who they are and where they belong. Socialization affects both personality development and social behavior. Although it is a reality that the foundations of personality are laid in childhood and basic social skills are acquired in early childhood, socialization continues throughout life (Gelles & Levine, 1995). Children acquire the social, emotional and cognitive skills necessary to successfully participate and integrate into society through socialization. The way families react to their children's crying, the way they arrange their rooms, the way they talk to their children, the toys they buy for them, the people they allow to spend time with them affect the socialization and subsequent development of the child (Berns, 1997).

Socialization, which is very important for both individuals and the society they live in, is the process of learning to be human from the point of view of the individual, while from the point of view of the society, it is the process of maintaining and guaranteeing its existence by teaching its culture to its new members. Through this process, people come together around the common values that hold society together. If a culture wants to continue its existence, it has to transfer its distinctive features to its new members. If it fails to do so, that society ceases to exist (Little, 2016).

From a sociological perspective, biology provides a ground for human development. Our genes, on the one hand, direct our cells to become human rather than a tree, frog or ape, and on the other hand, determine the color of our hair, eyes and skin, our blood type, gender and approximate body type. It gives us the ability to walk, talk, and use our hands and brains in a humane way. It establishes a timeline for development. For this reason, all normal babies start walking at about the same time. All normal children all over the world learn to speak in the same order: First they grumble, then they enter a period in which they express their troubles in one word, then in two words. Eventually, they learn to make regular sentences with more words and to ask questions. All humans become sexually mature between the ages of 12 and 18 because the basic blueprint is genetically determined. However, socialization determines the details of development. For example, although a child's ability to speak a language is determined by his genes, which language he will learn and how well he will speak that language depends on the culture he grew up in and the people around him. Without the opportunity to interact with other people, he cannot develop the capacity to speak and love. Likewise, how a person feels about the changes that occur in their body during adolescence and how they express their sexuality is determined by the culture of the society in which they live and their personal history. All this shows us that socialization is the key to unlocking the child's locked potential so that he can be both a respected member of the human species and a unique individual (Gelles and Levine, 1995). As long as this key is used and the lock is unlocked, it doesn't matter what kind of potential a person came into the world with.

According to Elkin and Handel (1984), three prerequisites are necessary for adequate socialization.

An Ongoing Society

In order for children to be able to socialize, there must first be an ongoing society. Children who open their eyes to the world in a ready-made society, where they have no contribution to its formation and functioning, are almost like “raw recruits” who need to be trained. They came into the world against their will and have no knowledge of how to deal with the world. The function of socialization is to transfer culture to new members of society and to motivate them to participate in the established social order. The society that children find ready has a structure in which people living in it can more or less predict how each other will behave, think and feel.
Biological Inheritance

The second prerequisite for socialization is sufficient biological heredity. It is clear that people with serious hereditary problems such as mental retardation either cannot socialize or have serious problems in the process. For example, socialization depends on memory. An adequate memory can develop only if the parts of the brain that govern memory are not damaged. A baby born with a severely damaged part of the brain may not develop an adequate memory. Therefore, serious defects that occur in the biological organism prevent adequate socialization. Other organic deficiencies also create various problems, although not as much as the deficiencies in the brain. For example, hearing-impaired children cannot learn to speak in the same way as non-disabled children, because they cannot hear their own voices. Visually impaired children cannot take advantage of some opportunities open to normal people. However, children who are visually impaired, hearing impaired or born with problems in their arms and legs because their mothers used thalidomide during pregnancy can turn into individuals who adapt to society more or less by receiving special education, although they cannot fully normalize.

Human Nature

The third prerequisite for socialization is human nature. In order to socialize, the child must have human nature. Charles H. Cooley, an early American sociologist, used this term for the first time. What he means by this term is something universal, which is not found in animals, but is not peculiar to some societies. It is not easy to define this concept succinctly, but highlighting some of its key components that are particularly important can help to understand the concept. These are the ability to form emotional relationships with others and to experience emotions such as love, sympathy, shame, jealousy, pity, and pride. Although less important, it should be noted that this concept also includes the ability of human beings to transform their experiences into symbols through speaking, writing and thinking. Considering that although some societies do not know how to write at all and some people living in the past do not know not only how to write but also how to read, they are still socialized enough, it can be concluded that writing is not necessary for adequate socialization, but it is clear that socialization is not possible without speaking. Speech also depends on the capacity to symbolize.

There is a very classical yet correct definition for man: Man is a social being. Although a significant part of our problems stem from living with other people, it is impossible for us to lead our lives in a meaningful way in the absence of others. The existence of others is so important that without them, even if we are able to survive, we cannot either acquire our basic human traits or maintain our human traits. Of course, the mere physical existence of others is not enough to learn to be human. In addition to the physical existence of adults, the interaction they will establish with babies should also be a humane interaction. In the event that this interaction is not humane, as can be seen in some examples to be explained below, not only the psychological existence of babies but also their biological existences are in danger. Even if their biological existence continues, it is inevitable that their psychological existence will be damaged. For the reasons mentioned, I think a fourth should be added to these prerequisites. It is humane interaction. Because if the interaction is not humane, the other prerequisites are meaningless.

What is humane interaction and why is it so important? First of all, it should be noted that humane interaction and human interaction are not the same thing. If a child is not forced to lead an isolated life by being abandoned in the forest or confined to a corner of the house, as can be seen in some examples below, and grows up among people, it means that he or she is necessarily experiencing interaction. However, the fact that a child grows up with people does not mean that the interaction he experiences is human in any case. If a child cannot feel that he is a valuable member of his family and the society he lives in because of being humiliated, despised, ridiculed, mocked, disregarded, ignored, and exposed to violence, it doesn't matter that people grow up. But it should not be forgotten that one of the factors that determine whether the interaction is humane or not is the things that are exposed, while the other is the things that are deprived. Because human personality is determined by those who are deprived as well as those who are exposed from childhood. For this reason, it is necessary not only
to meet the nutritional and shelter needs of the child, but also to meet the more important needs such as love, care and compassion. It is unrealistic to expect people whose needs are not met despite living among humans to develop a healthy personality. If there is so much injustice, oppression, murder and terrorism in the world today, people can easily inflict violence on each other, one of the reasons for this is that these people grew up without humane interaction. Miller (2003, p. 214) expressed this fact quite simply and accurately: “I have never met a person who received respect and attention as a child, but felt the need to take the lives of people when he grew up.”

A 2014 study conducted in a town on the Italian island of Sardinia found that the life expectancy of the inhabitants of the town was quite long, with eight of them reaching the age of 110. According to the results of the research, the secret of the long life of the people of the region is not due to their genetic characteristics, but to their close social relations with each other and their constant cooperation like a family. In fact, it can be said that these people extend their own lives by keeping their social relations well and helping those who need help (Sayar and Yalaz, 2019). Strong social relationships are so important that they strengthen the immune system, prolong life, speed up the recovery process after surgery, and reduce the possibility of depression and anxiety. Therefore, we can more or less predict the level of happiness and how long someone will live, taking into account the social relations of someone whose genetic characteristics and personality we do not know (Szalavitz and Perry, 2020). In the preface to his book Outliers, Malcolm Gladwell (2020) tells the story of people in the 1950s, whose ancestors immigrated from Italy and settled in a rural area of the American state of Pennsylvania, where they founded a village that they called Roseto. A doctor named Steward Wolf, who teaches at the University of Oklahoma School of Medicine, is invited to Roseto to speak. When the speech was over, one of the doctors working there says Wolf, “You know, I have been practicing my profession for 17 years. Patients come to me from everywhere; but it's rare that I meet anyone from Roseto with heart disease under the age of 65.” Wolf is stunned. Because he thought it was impossible for a doctor to have almost never encountered heart disease in those years when deaths from heart attacks were quite common among men under 65 years of age in the USA.

Wolf decides to investigate this situation. With the help of some of his colleagues and students at the university he teaches, he examines the doctors' reports, starting from records as old as possible, and tries to find out the causes of death of the town's people. The results are surprising: “There was hardly anyone in Roseto under the age of 55 who died of a heart attack or showed any signs of heart disease. In Roseto, the death rate from heart disease among men over 65 was half that of the entire United States. In fact, the death rate from all causes in Roseto was 30 to 35 percent lower than expected.” Deciding to deepen the research, his sociologist friend John Bruhn and sociology graduate students in Wolf's study team go around the houses one by one and apply a questionnaire to everyone aged 21 and over. It was Bruhn's turn to be surprised: “There was no suicide, no alcoholism, no substance or drug addiction, and very little crime. There was no one receiving social assistance. Then we looked at peptic ulcers. He was in no one. These people were dying of old age. That’s all.”

Wolf's initial thought was that the diet of the Rosetans made them healthier than other Americans. But Wolf realized that his thinking was wrong when he had dietitians analyze the typical eating habits of these people. Because the people of Roseto both liked fatty foods and smoked a lot. Moreover, obesity was also quite common. Additionally, “this wasn't a town where people got out of bed at sunrise and did yoga or jumped on their bikes and cycled actively for six miles.” Realizing that the findings could not be explained by diet and exercise, Wolf turned to genetics. But he concluded that genetics could not explain the situation either. Then he wondered if the Rosetans living in the foothills had a positive effect on their health. Scanning the medical records of the towns of Bangor and Nazareth, which are very close to Roseto and have similar geographical features, Wolf found that the death rate from heart disease in men over 65 in both towns was three times higher than Roseto.

Realizing that the secret to Roseto isn't diet, exercise, genes, or location, Wolf found the real reason while walking around town with fellow sociologist Bruhn. “They saw how the people of Rosetan visited each other, stopping in the street to chat in Italian, for example, or cooking for each other in their backyards. They learned about the extended family clans that underlie the social
structure of the town. They saw in how many houses three generations lived together and how grandparents were respected. They went to religious ceremony at Our Lady of Mount Carmel and saw the integrating and calming effect of the church. They identified 22 civic organizations in a town with a population of less than 2,000 people. They discovered society’s egalitarian philosophy of life, which kept the wealthy from flaunting their own successes and encouraged them to help cover the failures of others. By transplanting the paesani culture of southern Italy into the mountains of eastern Pennsylvania, the Rosetans had created a strong, protective social structure that isolated themselves from the pressures of the modern world. The Rosetans were healthy because of where they came from, because of the world they had created for themselves in their tiny town in the mountains.” Bruhn says, “I remember the first time I went to Roseto; You could see the family dinners where three generations met, all those bakeries, people walking the streets, sitting on their porches talking to each other, …” he says and adds “It was fascinating.” In the conferences they attended, while their colleagues attributed the secret of longevity to genes and physiological processes in line with the dominant paradigm of the time, while no one thought that there could be a connection between health and social relations, Bruhn and Wolf were “talking about the mysterious and magical advantages of people standing in the street talking to each other and living under the same roof for three generations.” They said that in order to be able to comment on their health, it is necessary to know the culture of which the individual is a part, who their friends and family are, and where their family comes from. For them, the values of the world we live in and the people around us have a profound effect on who we are.

But unfortunately, the next generations of Rosetans did not appreciate the features of their ancestors that made them healthy and over time they turned into typical Americans (Sayar and Yalaz, 2019).

As can be seen, a culture dominated by warm and sincere relationships affects not only the mental health of people but also their physical health. Although this is a known fact, today’s doctors still do not advise people with cardiovascular disease to “make two new friends and visit their aunts more often”, even though they recommend diet, regular bodily movements and prescribe various drugs (Szalavitz and Perry, 2020, p. 309).

A professor named Sheldon Cohen took two groups of people one of which is lonely people and the other is people with close social bonds with others into the laboratory, in order to determine whether lonely people or people with good social relations get sick more often, and injected both groups with the flu virus -with their knowledge “It turns out that lonely people are three times more likely to catch the flu than people with close ties to others.” Another scientist named Lisa Berkman followed two groups of people, one of which was lonely people and the other was people with multiple ties with others for nine years to figure out which group was at greater risk of death. At the end of the study, he found that “lonely people are two to three times more likely to die.” Loneliness made almost every disease more deadly, such as cancer, cardiovascular ailments, respiratory problems. In fact, when the evidence was examined as a whole, loneliness itself proved fatal (Hari, 2021, p. 94-95).

Neuroscientist John Cacioppo closely followed “229 Americans aged between fifty and seventy” to find out whether isolation and loneliness or depression came first. He formed a group of “half male, half female, one-third Latino, one-third African-American, one-third white” to show a wide distribution of subjects. At the start of the study, “none of the 229 Americans he followed was neither depressed nor alone. Once a year they would come to the lab and undergo a series of tests. John was examining their physical and mental-health states.” Afterwards, the research team asked these people how many people they had contact with per day, how many people they felt close to, and who they wanted to share their happiness with, in order to understand how lonely or isolated they felt. After five years, in most cases, symptoms of loneliness appeared first, followed by depression. Moreover, as the level of loneliness progressed from 50 percent to 65 percent, “the risk of developing depressive symptoms increased eightfold.” John, with his research; “He concluded that a significant portion of depression and anxiety in society was caused by loneliness” (Hari, 2021, p. 97).
Sam, a psychiatrist, believed that antidepressants were not effective in treating depression. Together with a group of like-minded people, they opened a health center in East London. The area where the health center opened was one of the poorest areas in London. Sam opposed those who say that depressed patients have something wrong with their brains or bodies, and claimed that what was wrong was in the lives of these patients and that they had to change their lives in order to be healed. Because he “realized that his patients were often depressed because they were deprived of the things that made life worth living.” For him, what patients really needed was “reconnection” not medicine. For this reason, doctors working in this extraordinary center would prescribe socialization to the patients who applied to them, and instead of medication, they would write “one of a hundred different ways to reconnect with people, society and values that really matter” (Hari, 2021, p. 232-233).

To better grasp the importance of socialization, let’s suppose there is a 6-year-old child who has been almost completely deprived of human contact from birth. Suppose that, after this child was born, his mother did not clean his diaper and did not interact with him except for minimal feeding. Additionally, let the child be alone all day and night for years and never go out. Suppose this child is 6 years old. What kind of picture emerges when their behavior is compared to the behavior of a normal 6-year-old child? After explaining this hypothetical situation, when different people were asked the above question, they probably came up with the following list of answers. First, the child cannot speak; he is only able to make meaningless sounds that resemble at most grunts. Secondly, the child is afraid of us and probably hides in a corner. Third, the child does not know how to play and how to communicate with us. If he was given some food on the plate and a cutlery with him, he would not know how to use the cutlery, so he would eat the food with his hand. Fourth, the child cannot express certain emotions. For example, he may cry but cannot laugh. Fifth, because the child is unfamiliar with the mundane material products of our culture, such as cell phones and televisions, he is likely to be incapable of understanding and frightened when he sees them. In this and many other ways, this child is strikingly different from his 6-year-old peers growing up among humans. It looks like a human but cannot act like a human. In fact, in many ways, he behaves more like a frightened animal than a 6-year-old child, and is less capable of following orders than a typical dog (Barkan, 2017).

This example shows that socialization is necessary for us to behave like full human beings. We cannot become a part of society and culture without socialization, and we cannot socialize without social interaction. The example of the socially isolated child was hypothetical, but the existence of such children, called feral children, is unfortunately real, as will be seen in the examples below. These real examples provide poignant evidence of the importance of socialization for our ability to function as human beings and social interaction for socialization (Barkan, 2017).

It is useful to take a closer look at the children who are abandoned in the forest, isolated in their homes, or raised in orphanages in order to better understand that turning into a full human being goes through socialization. Now we can start by taking a closer look at some of the children abandoned in the forest.

**Case 1: Victor**

From the 14th century to the present, there are more than 50 recorded cases of “feral children” who were abandoned to nature at different times and managed to live in one way or another. It is estimated that some of these children were raised by animals or at least lived with them. One of the most famous of these recorded cases is “the wild boy of Aveyron”, discovered in northern France in 1797 (Elkin and Handel, 1984; Malson, 1972, cited in Thio, 1989).

Named Victor by his later doctor, Jean Itard, this boy was first spotted while wandering around naked in the woods. Then, for more than a year, he was occasionally seen trying to root potatoes, radishes, and various plants from the fields, and searching for acorns. He was eventually caught on a tree by hunters. After preliminary examination by some local government officials, he was sent to Paris to be placed in a school for the deaf and speech impaired, by order of the then interior minister Lucien Bonaparte, who was also Napoleon’s brother. In those years, which coincided with the
French Revolution, the interest shown in the relationship of the individual with the society was at its peak. It was believed that studies on “savages” would make significant contributions to the understanding of human nature. For this reason, the case of “the wild boy of Aveyron” became a subject of detailed research (Elkin and Handel, 1984).

He was estimated to be 11-12 years old when he was found. Although there were various scars on his body, there was no serious physical deformation. He was completely naked. He had a strange gait as he walked with his hands. He ate uncooked food and couldn't even do simple things that much younger children could do. Although he had no hearing problems, he was completely incapable of speech and expressed himself only by crying and making incomprehensible sounds. He didn't care if the weather was hot or cold; she refused to wear clothes even in the coldest weather. He had strange behavior such as sticking his hand in a fire. He couldn't concentrate on one spot with his eyes, didn't even respond to loud sounds. He tried to identify edible foods based on their smell, not their appearance, and disliked sweets and hard drinks. He had no emotional attachments and no sexual expression. All this data led a group of experts to think that he was mentally handicapped and could not be educated, but Jean Itard, who was a doctor, disagreed. He began to take a close interest in Victor and gave him training (Elkin and Handel, 1984; Lane, 1976, cited in Thio, 1989).

Jean Itard hoped that by the end of the training, five goals would be achieved: 1) to draw Victor into social life; 2) to awaken his nervous sensitivity with the most energetic stimulation, and sometimes with intense emotions; 3) to give him new and more social needs and thereby expand the scope of his ideas; 4) To teach to speak; 5) Developing the ability to reason, albeit at a simple level (Elkin & Handel, 1984).

Victor looked a little more human after three months of training. He learned to take the roasted potatoes with a spoon, not with his hands, to wear clothes, to sit in a chair, to wait without haste before the food was placed on the table, to eat on the plate and to use cutlery. He began to show some emotions such as happiness, gratitude, and regret, but compassion did not develop. He showed his happiness and gratitude from time to time by hugging Itard and the female maid who took care of him and took him for a walk. Instead of sleeping on a cold, wet bed at night, he began to wake up and go to the bathroom. Itard took a close interest in Victor for six years. Despite his hard work and applying a professional training program, Victor was greatly disappointed that he never learned to speak. Victor's inability to speak continued after Itard. Despite living for more than 40 years, he could neither learn to speak nor become a normal person (Elkin and Handel, 1984; Lane, 1976, cited in Thio, 1989).

**Case 2: Amala ve Kamala**

In 1921, two girls, thought to have been raised by wolves in the Bengal forests of India, were found, one estimated to be 3 and the other 5-6 years old. Among the children found in the wolf's den by a Hindu missionary, the younger one was named Amala, and the older one Kamala. Amala died within a year. Kamala lived in a missionary school for 8 years until she died of typhoid. When the children were found, they lacked many of even the ordinary “human” traits. They were attacking people who found themselves by making a sound like a dog growl and trying to bite them. They weren't wearing any clothes. They walked with their hands, ate raw meat, and ate food with their mouths without using their hands. They had a dull facial expression that did not allow them to understand their current feelings. During his stay at the missionary school, Kamala made a noticeable improvement, especially after she developed an emotional attachment to the lady of the missionary who found him. She learned to eat cooked food, dress up, play with other children, express various emotions. As she socialized, she began to like people. She was able to understand a simple language and construct three-word sentences, but she could never develop in accordance with his age level (Elkin and Handel, 1984; Singh and Zingg, 1942, cited in Thio, 1989).

While a child psychoanalyst named Bruno Bettelheim firmly stated that the story of Amala and Kamala being raised by wolves was a myth, a later author analyzed the available data and concluded that these children spent their childhood in a family of wolves. While it is not known
exactly which view is correct, it is clear that Kamala suffered from extreme emotional deprivation. To use Cooley's term, Kamala did not have a human nature when she was found. As a result of the close personal contacts she had during her time at the missionary school, she could only partially possess human nature (Elkin and Handel, 1984).

We never know for sure whether Victor and Kamala were raised by animals. It is possible for these children to be nursed by an animal, and it is also possible that when they are left in the forest, they have passed the nursing period and reached an age to collect food for themselves. One thing we do know for certain, however, is that they were deprived of normal socialization, and the effects of this loss continued throughout their lives (Thio, 1989).

Case 3: Shamdev

Shamdev was about 5 years old when he was found in the forest. He was afraid of people, playing with dogs. He hated the sun and spent his time in shady places. He couldn't stand still when it was dark. They had to tie him up to prevent him from going near the jackals who were howling near the village. If someone had killed a coyote, he was smelling the blood and running towards it. He ate the chickens he caught alive, along with their giblets. Later, he developed a unique sign language: Crossing his thumbs and clapping his hands meant he wanted chicken or food (Observer, 30 August 1978; cited in Bilton et al.).

When the case studies of Victor, Kamala, and Shamdev are examined, it is understood that although the lives of these children before they were found are not known exactly, they were either abandoned in the forest or lost at a time when they reached the age of walking and managed to adapt to the life in the forest somehow and survive. These children were probably abandoned in the woods to die, by their parents or whoever they were. It should not be a prophecy to say that almost all of the children who are abandoned or lost in this way will die, except those found in a short time. For this reason, these examples are valuable examples that cannot be found even if they are searched for scientist. The fact that they are not likely to be repeated as an experiment also increases their value. Doctor Itard may have been involved with Victor, who didn't have many of the ordinary human traits when he was found, for 6 years from the very humane thought of helping a child in distress. However, he may have been interested in the thought that he was faced with a historical and exceptional event and that such an opportunity would never come his way again. Regardless of their intentions, what they do is valuable for Victor, but much more valuable for humanity. Because although he could not reach some of his goals as a result of his 6-year effort, he shed light on the studies to understand human nature and made it possible to see more closely how serious deprivations prevent being human.

Less deprivations are also harmful, if not as much as the great deprivations experienced by the persons mentioned above. There are three well-known examples of such deprivation in the United States from the 1900s: The children named Isabella, Anna and Genie were taken away from other people with their mothers and imprisoned in their homes, and their imprisonment continued uninterrupted until these children were noticed (Thio, 1989). A child named Danielle, who was noticed in 2005, also went through a similar isolation process. We can now examine these case studies.

Case 4: Isabella

Isabella was an illegitimate child. She spent the first six years of her life in near absolute isolation in a dark room with her mother, who was deaf and speechless. She had almost no contact with people other than his mother. She had almost no contact with people other than his mother. Because her mother's parents were so ashamed that Isabella was an illegitimate child that they made a concerted effort to keep her out of sight. During the isolation period, no one spoke or made contact with her, including members of her mother's family. Her body was deformed because she was not fed enough and was deprived of sunlight. Finally, in 1938, the life she lived must have gotten so sick of her that Isabella's mother ran away from home, taking her daughter with her. During this escape, Ohio
State officials found them. Speech therapists and psychologists who first dealt with her found that she was very, very backward for a six-year-old. She couldn't speak, and she couldn't understand other people's speech either. Her intelligence was found to be close to zero on an IQ test. Many features of normal children, such as not only speaking, but also the desire to play and communicate with others, were almost absent in Isabella (Schaefer, 1997, 76; Abrahamsen, 1990; Barkan, 2017). In fact, there was little indication that Isabella was human. It was not clear whether she had a sense of hearing or not (Elkin and Handel, 1984). She was so wild that she was afraid of people, showing hostility to them and making strange noises. She treated strangers, especially men, like a wild animal. Combining all the data, the experts concluded that Isabella was mentally retarded and could not be educated. She was lucky, however, and underwent systematic training. Although the initial progress was slow, she learned to speak. Despite the intense deprivation she experienced, she managed to read and write in a relatively short time like 9 months and started school two years later. She became a smart, cheerful and energetic girl. Apparently, along with her education, her interaction with her mother as a child helped her become a normal person. Because he lived with his mother, there was a certain interaction between them. They could communicate, albeit with gestures (Davis, 1947, cited in Thio, 1989; Hebding and Glick, 1992).

Case 5: Anna

On a cold winter day in 1938, while investigating possible child abuse, a social worker broke into a Pennsylvania farmhouse. In the cellar on the second floor of the house, he found a 6-year-old girl, named Anna, isolated. The girl, who was tied to an old chair with her arms pinned above her head so that she could not move, “her clothes were very dirty Her hands and feet were like matchsticks” (Macionis, 2012, p. 112).

Anna, who lived in very bad conditions until she was found by the authorities, was born in 1932. She was an illegitimate child, just like Isabella. Her mother was a 26-year-old, mentally retarded, single woman when her mother gave birth to her. Angry that her daughter gave birth to an illegitimate child, the grandfather did not want her grandchild at home, so Anna had to spend the first six months of her infancy in different shelters. When her mother could not afford her care, she brought her back to her grandfather's house. When her grandfather’s anger did not subside, her mother imprisoned her in the cellar. The cellar was small and stuffy. Because her mother worked all day and her grandfather hated to see her, Anna lived in solitude almost all the time. The only food source was milk. Anna, who could barely survive due to the harsh conditions she was exposed to, lived almost without seeing anyone for six years until 1938, when a social worker found her (Macionis, 2012; Barkan, 2017). Her mother only fed her enough to survive, neither spoke, touched, nor bathed her. She was almost like a skeleton when she was found in 1938 when she was 6 years old. She laid in her own filth. She could neither speak nor walk. She was sitting quietly on the floor, looking around blankly. It was not possible to understand her feelings by looking at her face (Davis, 1947, cited in Thio, 1989). Her condition was so heartbreaking that those who saw her thought that she had no hearing or vision (Elkin and Handel, 1984).

Sociologist Kingsley Davis, who was aware of Anna's condition and learned that she was staying at the municipal guest house, went to see her with great excitement. Davis was shocked when he saw the skinny Anna who couldn't laugh, talk or even smile. Anna was completely insensitive, as if there was no one around (Macionis, 2012, p. 112).

Socialization efforts have not been very successful. She was able to do simple things such as walking, feeding, brushing her teeth, following simple directions, but she never learned to speak and was unable to normalize. Finally, she died at the age of 11 (Davis, 1947, cited by Thio, 1989). When she died, she was at the level of a 2-year-old child in terms of social and mental functions (Hebding & Glick, 1992).
Case 6: Genie

Genie was 13 years old when she was found in California in 1970. She could not stand upright and could not speak. She had the intelligence and social maturity of a 1-year-old, she. She had been living without normal socialization for 12 years. From the age of 1 to 13, she lived in isolation in a small room. She was tied to a chair during the day and could only move her hands and feet. Her father, if he had not forgotten, used to put on a straitjacket and lock her in a cage at night. When she made a noise to get attention, her father would beat her with a wooden stick. Her father, who never spoke to her, only occasionally barked and growled like a dog. Her terrified mother was forbidden to speak to Genie. She was quiet and hasty at feeding times. Her mother could only give milk, cereal, and the occasional egg. Finally, she gathered her courage and managed to escape with the Genie. Her father committed suicide shortly after this incident (Pines, 1981, cited in Thio, 1989; Levine, 1995). The father, who seemed to have made cruelty a distinctive personality trait, had another incident. When Genie's older sister was two years old, the father, disturbed by her crying, locked the girl in the garage; cold and neglect had caused the death of the child (Gerhardt, 2019).

After Genie was found, she was taken to the Los Angeles Children's Hospital. A medical examination revealed that Genie could not chew solid food, control her bowels, walk normally, and speak more than a few words. She did not react to heat and cold, she treated people as objects. It looked more like a ghost than a human. She was trained by many psychologists and doctors and specialists from different branches, but there was no extraordinary development. During her first seven months in the hospital, she learned to walk with a jerky motion and responded poorly to toilet training. Yet she still had many irritating habits such as drooling and spitting. Research has focused on her particular language development. Despite the special attention of the therapists, language development was abnormally slow. After a few months she started to form two-word sentences, but the rapid and dramatic progress that occurs after a certain stage in normal children's language development did not occur. At the age of 21, despite the hard efforts of many experts over 8 years, her language ability was no more than that of a 4-year-old. After all, the experts must have thought that there was nothing left to do, so she was placed in an institution (Pines, 1981, cited in Thio, 1989; Elkin and Handel, 1984; Gelles and Levine, 1995).

Case 7: Danielle

In the summer of 2005, police detective Mark Holste went with an inspector from the Children and Families Department to a Florida home to review a report that a little girl was looking through one of the broken windows in a shabby house. Entering the house, Detective Holste and his team are shocked. What they saw was horrifying: The house was infested with cockroaches. Urine and excrement were littered with what appeared to be both humans and domestic animals. The furniture was in a dilapidated condition and the curtains were torn. When Detective Holste entered a small room, he found the reported girl staring blankly into the darkness. One newspaper later described the detective's first encounter with the girl: “She lay on a torn, moldy mattress on the floor. She was curled on her side… her ribs and collarbone jutted out… her black hair was matted, crawling with lice. Insect bites, rashes and sores pock her skin… She was naked-except for a swollen diaper… Her name, her mother said, was Danielle. She was almost seven years old.” Detective Holste rushed Danielle out of the house and took her to the hospital. After extensive testing, the doctors determined that although she was severely malnourished, Danielle had no problems with her eyesight and hearing, and that she could make sounds. Still, she wasn't looking into anyone's eyes. She did not know how to chew or swallow solid food, did not cry, did not respond to stimuli that could easily cause pain in other people. She also did not know how to communicate, as she did not know how to speak and the meanings of simple gestures and facial expressions such as nodding his head “yes” or “no”. Likewise, although tests showed she did not have any chronic diseases or genetic abnormalities, she had to have someone hold her hand to stay afloat. She needed someone's help not only to stand up but also to walk. But because her gait was laterally, it resembled a crab's gait more than a human's. As Danielle's story shows, Human is not a being who can automatically perform physical activities such as sitting, standing and walking, but a learning being (Little, 2016, p. 99-100).
Without socialization, it is not possible to know how the material cultural objects of the society will be used. Danielle, for example, did not know that the spoon was used for eating, the ball for playing, and the chair for sitting, as no one had taught her. She also did not know anything about intangible cultural elements such as beliefs, values, and norms. She had no idea of the concept of family, and was unaware of the cultural expectations of intermittent bathing to get rid of dirt and bad smells. Most importantly, she did not learn to use the symbols that make up language - through which we gain information about who we are, how we should adapt to other people and the natural and social world we live in (Little, 2016).

What happened to Danielle? Simply put, while her basic needs for survival were met, she was severely neglected. Based on their research, social workers concluded that she was left almost completely alone at home. She had not learned to walk, talk, eat, communicate, play, or even make an effort to understand the world around her, as regular interactions such as cuddling, hugging, talking, giving explanations on various topics were not there, which are commonplace for many children. Based on the sociological point of view, Danielle could not socialize (Little, 2016).

All of these case studies strikingly reveal the fact that we learn to be human, even though we are born as human beings. As emphasized above, although it is true that our genes create a timeline for development and that the basic blueprint of development is genetically determined, conditions must be suitable for development to take place in line with this outline. Contrary to popular belief, a human being is not an entity that develops “in line with the draft” when the time comes, like a pre-programmed machine, regardless of the conditions. When suitable conditions are not provided, he may fall far from his potential to be a full human being, depending on the degree of deprivation he has experienced.

Smaller deprivations are also harmful when compared to these case studies. Psychologist Rene Spitz, in his research in an orphanage in 1945, found that children who did not receive enough attention were affected by it. The institution had 91 children, all under the age of three. Only six caregivers were available to care for 45 infants under eighteen months of age. He saw these babies lying on their backs in their small rooms for most of the day without any human contact. Within a year, all of the children lagged behind in their physical, mental, emotional and social development. In the first year, the average score all children got on developmental tests dropped from 124 to 72. Two years later, more than a third of the 91 children had died. The 21 children who remained in the institution were extremely disabled despite adequate nutrition and adequate health care: They could not speak, walk, wear clothes or use spoons. When the children were fifteen months old, conditions had become much more favorable. For example, more caregivers were employed and children began to be given more opportunities for joint play activities. Despite this, their height and weight were below normal. Most of them could not walk, could not use a spoon, only one child could wear clothes and only two children knew more than five words. Spitz concluded that the conditions offered to children in the first year of their lives were very decisive for both their physical and psychological development, and that the more favorable conditions in the following years could not heal the damage caused by the deprivation experienced in the first year (Spitz, 1945, cited in Thio, 1989; Elkin and Handel, 1984).

In another study, Spitz compared children who grew up in typical American orphanages with those who grew up with their mothers in prison. Due to the insufficient number of caregivers, the children living in orphanages slept alone all day and did not receive enough attention and affection. The sheets stretched between the beds for fear of the epidemic also negatively affected the interaction of the children with each other. The children of imprisoned mothers, on the other hand, spent their time with their mothers. Spitz saw large differences between these two groups. Thirty-seven percent of the children in the orphanage died before reaching the age of two, while all the children who were with their mothers in prison were alive. This meant that deprivation of individual care could have fatal consequences. “While this staggering rate of child mortality may be considered normal in the absence of modern sanitation or medical care, it was unprecedented in industrialized countries sixty years ago.” Spitz stated that the children in the orphanage are more susceptible to the disease, they do not gain
enough weight, and their emotional and mental development is weak, on the other hand, he observed that the children who grew up with their mothers, even though they were in prison, seemed mentally and emotionally normal, were healthier in general, and had better development. While the children of imprisoned mothers survived thanks to the empathic bonds they formed, “it was the lack of love, not the unsterile conditions, that caused the death of the orphans” (Szalavitz and Perry, 2020, p. 58-59).

After Spitz’s pioneering work, many other psychologists documented that children who grew up in institutions where there was no human contact and interest, and where the stimulants necessary for the development of the child were insufficient, were badly affected by this situation. However, babies need constant interaction and attachment to other people for normal human development (Thio, 1989).

A similar study was conducted in Romanian orphanages. According to Çağlar (2019), Romanian President Nicolae Ceausescu banned birth control and abortion in 1966 in order to increase the population of his country. The number of children had to be at least five per family. Families falling below this number had to pay a special tax as punishment for breaking the rule. Known as the “menstrual police” of the state, gynecologists examined women who had reached reproductive age in order to secure a sufficient number of births. As a result, the number of children greatly increased, but this time an unexpected problem arose: Many families could not bear the economic burden of the new situation. Therefore, many poor families had to leave their children in state-controlled orphanages. When the Ceausescu administration was overthrown in 1989, the number of children abandoned by their families in Romanian orphanages reached 170,000.

These children living in orphanages had to live in inhumane conditions. Although their basic needs were met, they lived without emotional intimacy. There was one caregiver for fifteen children. These caregivers were also forbidden to hold children in their arms when they cried, and to show them closeness and affection. It was feared that the children would ask for more when intimacy was shown. Even if they cried, they forgot to cry after a while because no one took the children in their arms and took care of them. Regardless of whether they were boys or girls, their hair was cut in the same way, and they were all dressed in uniform clothes. They were meeting their toilet needs together, not in a closed area, but in potties lined up side by side at the expense of their privacy rights. Finally, these orphanages caught the attention of experts. When 136 children, the youngest six months old and the eldest three years old, living in these orphanages since their birth were evaluated, it was seen that their IQ scores were well below the general average. It turned out that their brains were not sufficiently developed and that they were behind in language development.

In another study, the IQ scores of children living in orphanages in Romania were compared with the IQ scores of children living in orphanages and living with their families. The children compared were 42 months old. It has been determined that the average IQ of the children living in the orphanage is seventy-seven, that of the children living in the orphanage is eighty-six, and that of the children who grew up with their families and did not go to either institution, is one hundred and three. “This study also revealed that the earlier a child leaves the orphanage, the better mentally and socially he is” (Szalavitz and Perry, 2020, p. 61).

It should be noted that both the children in Spitz’s research and those in Romanian orphanages did not experience as much deprivation as children abandoned in the forest or kept in isolation at home. At least there are other children and caregivers where they are staying. They probably also met with doctors and nurses, orphanage workers and managers from time to time. Although they lead a restricted life, there is no absolute isolation. However, it is obvious that they were deprived of the love and attention that the family environment can offer and they felt all the coldness of an orphanage to their bones. Although their physiological needs and shelter needs are met, they are deprived of even the most ordinary human interactions, such as being held, which means a great deal to children.
In 1944, 20 newborn babies in the United States were subjected to an experiment in which only their physiological needs were met and other needs were ignored. According to the experimental instructions, the caregivers to whom they were delivered were asked to approach these babies only to feed, wash and change their diapers when they got dirty, and do nothing else. Caregivers were instructed not to touch, make eye contact, or interact with babies unless they had to while doing their job. Special care was taken to ensure that the environment was sterile so that the babies would not experience any microbial problems. Utmost care was taken to meet their physiological needs. But in as little as four months, more than half of the babies died. Moreover, there was no physiological reason to explain their death; All of them were perfectly healthy. Sometime before their death, babies almost entered death mode; they had almost cut off contact with the outside world, stopped making noises, trying to get the attention of their caregivers, moving, crying or even showing any gestures or facial expressions. Interestingly, death came just after this ‘give up’ phase. The researchers decided to end the experiment at the end of four months to avoid causing more deaths. But the sad thing is, despite the fact that the babies who entered the stage of “giving up” were immediately removed from the experimental environment and taken into a natural family environment, unfortunately they could not be saved (Kaya, 2019).

All of these examples show that sociological birth is as important as biological birth; it shows that in order for us to continue our lives in a healthy way, the second birth as well as the first birth should go smoothly. As it is known, those who are born with some genetic disorders or disabilities cannot do what normal people do easily, or they do it with great difficulty. This prevents their active participation in life. Likewise, those who did not grow up with people or who did not experience human interaction even though they grew up among people do not acquire some basic human characteristics.

While this is the case in humans, how is it in animals? In this regard, Harlow’s experiments on monkeys are quite eye-opening. Harlow separated the baby rhesus monkeys from their mothers within a few hours of their birth, placing some in cages with false mothers and leaving others in completely isolated rooms. There were two false mothers in each cage. One of the mothers had a feeding bottle made of metal wire and attached to it, from which the baby could suckle. The other was made of wood, covered with fabrics, and looked like a normal monkey, but without any attachments for the baby monkey to feed on. Before the experiment begins, if given the opportunity to choose, it is predicted that the baby monkeys will get closer to the metal mother model, which they satisfy their nutritional needs from the bottle on them, and will spend most of their time next to her, baby monkeys surprised Harlow and the research team by showing a much greater affinity for the cloth mother model and spending most of their time with it. When they were afraid of something unfamiliar, they ran to the cloth mother model and hugged her; When they were moved away from the cloth mother model and brought to the wire mother model, they showed considerable discomfort. In cases where two mother models were placed side by side, the pups were able to suckle from the bottle on the metal mother without getting up from the cloth mother's lap even when they were going to be fed. Harlow thought that these preferences of the cubs might be due to the cold, so he added a heat-emitting device to the metal mother. However, the result did not change: most of the monkeys remained with the clothed mother. Although monkeys that spent time with false mothers did slightly better than those who were completely isolated, abnormalities were observed in the development of both groups. In the post-experimental research, it was found that monkeys who were raised separately from their mothers when they were babies, continued to have emotional problems when they grew up. It was observed that they could not adapt to the monkey community, had difficulty communicating with others, and exhibited high anxiety and aggression. The longer the isolation lasted, the more problematic the development of the monkeys was, with females abusing their young when they became mothers. The conclusion was clear. The monkeys suffered because their psychological needs were ignored. The fact that baby monkeys spend time with a fabric-made fake mother is an indication that they need not only milk but also an emotional bond (Harari, 2017; Barkan, 2017; Schaffer, 1997).

Another study on animals was done by Professor Martha McClintock. Distinguish between lab rats, McClintock raised some individually in separate cages, while others raised them in groups. The
results showed how important it is to grow within a community. Because “the incidence of breast cancer tumors was eighty-four times higher in secluded mice compared to mice with a community around them” (Hari, 2021, p. 103).

As it is known, one of the acquisitions of children in the process of socialization is language. From an early age, children learn whatever language is spoken around them. Moreover, they do not need to make a special effort while learning this language. When everything is normal, they start talking when the time comes. Well, if no language is spoken next to a person, is there a language that this person can speak spontaneously? If yes, which language is it? Like many people throughout history, King of Prussia II, Frederick who lived in the thirteenth century also wondered about the answer to this question. II. Frederick wanted to find out whether babies who were not spoken to or had no verbal interaction with them would spontaneously speak Hebrew, Greek, Latin, Arabic, or the language of their parents. Thus, it would be determined which was the first and original language of humanity. It would be decided that whichever language the children who grew up without being spoken with them started to speak, that was the real language of humanity. It was obvious that the way to find out was through an experiment, but such an experiment was not moral at all. Because no one would give their child as a subject for such an inhuman experiment to learn what the language of the first ancestors of the human family was. Therefore, it was not easy for an ordinary person to attempt this task, but since he was the king, it was not so difficult to do this experiment that he set his mind to. He ordered the nannies, wet nurses to only give milk to the babies in the experiment, but never talk to them. As a result, it was seen that all of the babies who were not spoken to died (Kaya, 2019; Dodson, 1993).

When II. Frederick decided to conduct such an experiment, he probably believed that these children could speak one of the languages mentioned above. But we can say with certainty that this is not possible. How the first humans learned the language is a separate topic of discussion, but in order for a child to learn a language, that language must first be spoken next to the child. If no language is spoken, the child cannot speak any language. He only makes some sounds, but the sum of these sounds does not correspond to any of the languages spoken on earth today. Of course, an individual who grows up among people and learns to speak a language in the process can learn other languages with his own efforts, but the prerequisite for this is that a language is spoken next to that person after he or she is born. According to a common belief in Anatolia, there is a language that a person who does not speak any other language can speak spontaneously, and that is Arabic. This thought is related to the fact that the Anatolian people are Muslim and the language of the Qur'an is Arabic. However, as emphasized above, it is impossible for a child growing up in these conditions to speak Arabic or any other language. In order to better understand this fact, it is sufficient to look at the hearing impaired. As it is known, children born with hearing impairment cannot learn to speak. The reason these children do not learn to speak is because they cannot hear. Before they can speak, they must first hear. When there is a chance to treat these children, first of all, a treatment is applied to ensure their hearing, and if it is successful, speech training is started.

As the Greek historian Herodotus wrote in his *The Histories*, Egyptian Pharaoh Psammetikos, probably out of curiosity similar to II. Frederick, ordered two newborn babies to be taken from their parents and given to a shepherd, but forbade the shepherd to talk to these babies. According to the Pharaoh, it was only in this way that one could learn what language the first people spoke. Whichever word the children first said to themselves without any outside interference, the language to which that word belonged would be accepted as the first language of the people. The shepherd noticed two years later that the children were shouting *becos*. However, *becos* was not an Egyptian word. As a result of the research, it was revealed that the Phrygians, who lived in Anatolia long ago, used this word to mean bread. That is why the Egyptians of that time concluded that the origin of themselves and their language was Phrygia (Heredotos, 1973).

I want to point out a misunderstanding here. Even if we assume for a moment that the above is true, the fact that the first word that comes out of the children's mouth corresponds to the word “bread” in Phrygian language does not mean that the children have started to speak that language. Because
speaking a language is more than just pronouncing one of the words in that language. However, as far as I can see, those who voiced this issue are trying to create a perception as if the children have started to speak Phrygian, although they cannot give any information about what happened next, based on this information alone. However, this is not true.

**CONCLUSION**

Being a social being, human beings come to the world not as a human being, but as a **humanoid being**, who is a candidate to be human, even if they do not have any problems in terms of genetic and physical characteristics. Socialization is the journey of this humanoid being to become human. To be able to survive this difficult and troublesome journey without any accident and to be a full human being depends primarily on living in a human community. Otherwise, he will never be able to become a full human being, even if his biological existence continues, as research on children abandoned in the forest or isolated in their homes has shown.

Socialization is first and foremost a learning process. In this process, the individual not only uses the tools that facilitate daily life, and learn various abilities such as doing some mathematical operations, to speak the language correctly, to eat food directly with one's hand without the need for a fork, spoon, knife, chopstick or tool, but also learns to think and act in accordance with society's expectations. In addition, how to treat whom; what it means to be a man or a woman; how, when, why and with whom he can have sexual intercourse. In this process, he learns what the moral value judgments of the society he lives in are. This learning is carried out through various people, groups, institutions and organizations with which the person interacts throughout his life, although the levels of influence are different from each other. These intermediaries that enable the person to socialize are primarily family, neighbors, relatives, peers, teammates in various sports activities, teachers, religious institutions and the media (Eryaman, 2021). These intermediaries guide the person on the journey of becoming human (Newman, 2019). The full emergence of the potential that exists in the person depends on this guidance.

Of course, human is not an entity independent of his genetic features, but he is not a being wholly determined by his genetics. As Guest (2017, p. 53-54) emphasized, despite the fact that their genetic codes are 99.9 percent the same, the large differences observed in people's behavior show that behaviors are not entirely determined by genes. If man were a being wholly determined by his genes, there should not be such a great diversity even in the fulfillment of purely biologically based needs such as food, drink, sleep and sexuality. There is such a great diversity that people from different cultures may describe each other as “weird”, “funny”, “ridiculous”, “absurd”, “disgusting”, “disgraceful” or even “pervert” based on the way they meet their needs. Although we have some genetically determined characteristics, such as hair color, eye color, and susceptibility to certain diseases, learning is of such central importance that, as emphasized above, a human being is not a being who can automatically perform physical activities such as sitting, standing and walking, but is a learning being.

In order for the importance of socialization to be better understood, the question of “without society, what would humans be like?” should be asked. Thanks to the Human Genome Project, it is now clear what it means to be “biologically” or “genetically” human, but being “biologically” or “genetically” human is not enough to be fully human. Because, unlike other living things, human beings acquire their behavioral patterns as a result of their lifetime experiences, not through the genes they inherit from their ancestors. During the transition from infancy to childhood, from childhood to adulthood and old age, his genetic structure remains constant, but he interacts with a large number of people during this time (Andersen, Taylor and Logio, 2017, p. 77) and every interaction he experiences makes him a little more human.

Socialization is functional for the individual as well as the society. Through this process, while the individual learns to be and remain human, society continues its existence by bringing its members together around basic values and norms and thus transforming them into individuals who are
compatible with each other. The survival of a society partially depends on this harmony. It is not easy for a society in which everyone plays different strings to achieve the harmony it needs and maintain its existence. For this reason, while societies reward their compliant individuals with different methods in order to keep them on the road, they try to bring back their members, whom they think go astray, to the path with sanctions such as stigma, contempt, humiliation or exclusion.

REFERENCES


Online Preschool Inclusive Education in Turkey During the Pandemic

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Abstract

The main purpose of this study was to explore the experiences of preschool teachers who have inclusion students with special needs in their classrooms during distance education process carried out due to the Covid-19 pandemic. For this purpose, interviews were conducted with 10 preschool teachers who have inclusion students with special needs in their classrooms through online platforms. The findings obtained were analyzed by content analysis. As a result of the interviews, preschool teachers stated that they still had problems in technological infrastructure and difficulties using the online teaching systems, the families of the inclusion students with special needs did not participate in the distance education process at a sufficient level, and this process negatively affected the social interactions of the students. In addition, all preschool teachers who participated in the study stated that the online preschool inclusive distance education process was not suitable for students with special needs. All data obtain from this study discussed and some implications were suggested according to literature.

Keywords: Covid-19 Pandemic, Inclusive Education, Preschool Teachers, Distance Education.

DOI: 10.29329/ijpe.2022.467.10

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INTRODUCTION

The new coronavirus disease, which emerged in Wuhan, China in 2019, was declared as a pandemic all over the world by the World Health Organization (WHO) (Velavan & Meyer, 2020; WHO, 2020). This disease all over the world had negative effects, especially on the health system; the economy and tourism fields (Williamson & Hogan, 2020). The very high transmission rate and the rapid increase in the number of cases has abnormally complicated the burden on the healthcare system (Lai et al., 2020; Sethi et al., 2020). This situation has caused countries to take some measures (such as, lockdown, interruption of education, transition to distance education). One of these measures is the continuation of education services in the form of distance education (DE). According to the recommendations of the Scientific Council and the Ministry of National Education (MNE) in Turkey, DE was compulsory instead of formal education (MNE, 2020). The DE started to be performed in special education schools, preschools and other school levels through the Education Informatics Network (EIN), first on a television and then on a computer with a virtual classroom. The DE carried out on television, was performed in accordance with the daily curriculum of the general education schools on EIN, which is a national channel and can also be accessed via internet. In the virtual classroom, teachers were able to interact with students simultaneously on the computer. In different periods of 2020 and 2021, compulsory DE was also implemented for preschools and for a while DE was continued for preschool education.

The fact that the DE has different stakeholders such as teachers, students, parents. Using technologies like computers, tablets... may cause negative effect for the stakeholders in contrast to formal education. (Lassoued et al., 2020; Onyema et al., 2020). In addition to this, reasons such as long online courses, have more than one sibling at home, lack of internet infrastructure and technological tools have also caused the interruption of the DE (Habiba et al., 2020; Lassoued et al., 2020). One of the groups adversely affected by this situation is children with special needs. Because of their poor attention span and focus those children need adaptations and individualization for their education and also accompanying problem behaviors in disability make them more disadvantaged in the DE than other groups (Kaya, 2020). When it comes to inclusion practices it is getting even more difficult in DE. Socialization and social acceptance, individualized education, family participation are the benefits of inclusive practices. But having these profits is not easy during the DE. However, the importance of early education to be provided to individuals with special needs is indisputable. Intensive and uninterrupted education in the early years is very important in terms of reducing the developmental gap with peers, gaining skills, participating in independent life, and increasing the quality of life. Gaining these profits are not a suitable option for individuals with special needs who continue their inclusion practices with DE. In the light of this information, it is aimed to get the opinions of teachers who have inclusive student (IS) regarding the DE. In this context, the following questions were answered:

1. What are the experiences of teachers regarding the use of technology in DE?
2. What are the experiences of teachers regarding family (IS) participation in the DE?
3. What are their views on comparing the DE with formal education?
4. What are the experiences of teachers regarding peer interaction of the IS during the DE?
5. How did they perceive the DE?
6. What are the solutions of teachers regarding DE?
METHOD

Research Design

This study was designed with qualitative research and phenomenological method was used. In this study, the qualitative research method will be used to understand the preschool teachers' experiences with IS in the DE carried out during the pandemic and the effects. Thus, the structure of the targeted phenomenon was tried to be reveal out.

Participants

The study group was formed by purposeful sampling. Accordingly, the study group consisted of ten preschool teachers who have IS in their classes. Inclusion criterias are (a) voluntarily participating in the study, (b) working as a preschool teacher in the MNE, and (c) having at least one IS. Demographic information about the participants of the research is included in Table 1.

Table 1
Demographic information of the participants

<table>
<thead>
<tr>
<th>CN</th>
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CN: Code Name, GT: Graduation of Type, A: Age, G: Gender, EY: Experience of Years, WYIS: Working Years with Inclusive Students, SECU: Special Education Courses In Undergraduate, TCRT: Taking Courses Related To the Use of Technology, ST: School Type, CW: City of Work, T: Teacher, F: Female, U: Undergrad, G: Grade, NC: Nursery Class, KG: Kindergarten

Data collection tools

In this study, teacher information form and semi-structured questionnaire were used to collect data. Interview questions were prepared together by all researchers, and then five field experts were asked about the suitability of the questions to the research purpose. According to the expert’s opinions, the questions are finalized. Seven interview questions were used in the interviews. A pilot interview was conducted with a preschool teacher who was not a participant of the study in order to decide that
the final version of the questions. At the end of this interview, it was decided that the form and questions were suitable for interview and this study.

**Settings**

The data in the study were collected through online platforms due to the global pandemic. During the interviews, both participants kept their cameras open. The interviews were conducted in the participants’ and the researcher’s own homes.

**Collection and analysis of data**

While collecting the data, the third researcher made explanations about the purpose and process of the research and obtained the consent from the teachers. The timing of the interviews was planned with the participants in advance, and according to the preferences of the participants, meetings were held in the evening. The average time of the interviews is 46’32” and total duration was eight hours and 12’. Content analysis was used to analyze the data obtained from interviews. The findings of interviews were transcribed by the first researcher. Then, the second and third researchers reviewed the consistency. The latest version of the transcripts 29 pages and 950 lines. Gathered data were examined by the researchers, analyzed descriptively and placed in the table. All data have been collected in a single database. The created analyzes were coded independently by three researchers, finalized by looking at the consistency of the codes and a code list. The resulting lists were then grouped and interpreted under certain themes. Thus, raw data, which does not make sense on its own, has been made easy to interpret thanks to the created database.

**FINDINGS**

Themes and sub-themes are shown in Table 2. At the same time, the information obtained from the answers given by the teachers to the questions was written in the form of quotation.

Table 2

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-themes</th>
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<tbody>
<tr>
<td>Use of technology</td>
<td>Competence to use the system</td>
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<td></td>
<td>Internet access and technological infrastructure</td>
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<tr>
<td>Involving families to the process</td>
<td>Experiences regarding family’s participation in the education process</td>
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<td>Experiences regarding lack of knowledge while using the system</td>
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<td>Experiences of not being able to participate in education due to other factors</td>
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<td>Similarities and differences</td>
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<td>Differences between formal education and DE</td>
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<td>Peer interaction</td>
<td>Peer interaction and decreased social skills for the IS</td>
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<td>Expectations</td>
<td>Expectations for the IS in DE</td>
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<td></td>
<td>Teachers’ expectations in terms of their professional development regarding special education in DE</td>
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</table>
Teachers' Experiences Regarding Using Technology in the DE

In the theme of teachers' experiences of using technology in the DE, two sub-themes were reached: (a) Experiences related to the competence of using the system (b) Internet access and technological infrastructure.

Experiences related to the competence

This sub-theme is divided into two groups: those who think they are sufficient in using the system and those who still need support in using the system. T5, one of the seven teachers who thought they were sufficient to use the system, explained, “...You know, something had happened but the result was good. For example, I was far away from technology, but in this way I learned to use the system easily. I don't think it's a difficult system”. The number of teachers stating that they still need support in using the system is three. One of these teachers, T1, “I think we should have been given pre-training at the beginning of the term. In this way, we suddenly switched. I mean, it was unprepared. I personally have shortcomings” has explained her experiences.

Internet access and technological infrastructure

This sub-theme was divided into three as those who stated that access to the internet but had deficiencies in technological infrastructure, those who stated that both access to the internet and technological infrastructure were deficiencies, and those who thought that both access to the internet and technological infrastructure were sufficient. T3, one of the three teachers who stated that they had access to the internet and had deficiencies in technological infrastructure, stated that “Because the socio-economic level of my IS’s family is low, only the father has a phone at home. Although he has an internet connection, my student can participate in DE only if any time remains from the father. I think the technological infrastructure is insufficient for this system”. T8, one of the two teachers who stated that both internet access and technological infrastructure were inadequate, said, “Sometimes even my internet doesn't work here, let's say we are connected to the internet and the system collapses because everyone hold education sessions at the same time. It becomes very difficult to reconnect and communicate with everyone, the infrastructure needs to be strengthened...”. T4, one of the five teachers who thought that both internet access and technological infrastructure were sufficient, said, “We live in a central place. It is not possible to not have internet access or everyone has a smartphone, so there is no problem in accessing it”.

Teachers' Experiences Regarding the Involvement of Families in the DE

Three sub-themes were reached from the theme of teachers' experiences regarding the involvement of families in the DE (a) experiences on families participation in the education (b) Experiences of the lack of knowledge while using the system (c) Experiences of inability to participate in education due to other factors.

Experiences on families participation in the education

This sub-theme is divided into two as positive experiences and negative experiences regarding the participation of families in the DE. T2, one of the three teachers who thought that families' participation in the education was positive, said, “The best part of this Covid-19 process was family participation. Normally, parents brought the IS into the classroom. they did not know what we were doing, what we lived in the classroom, but now that the parents are with their child, they can see what their child is learning, what he/she cannot learn, how he/she reacts. The attitudes of the families became more understanding, more moderate” explained their experiences. T3, one of the seven teachers who had negative experiences with families' participation in the education, said, “We included the family in the process, but nothing happened as we wanted. There were activities that we could do with the family or there were situations where the family had to guide the child, but they did nothing, the family just sat next to child and watched, so there was no active participation” explained.
Experiences of the lack of knowledge while using the system

This sub-theme is in the form of lack of knowledge due to the fact that families do not receive preliminary training on using the DE system. T3, one of ten teachers who thought that families did not receive preliminary training for using the DE system, said, “We could not include the family in the process... Because there was no infrastructure preparation for this with the families. Even I suffered as a parent at the same time. Something could have been done to encourage the IS's family to participate.”

Experiences of inability to participate in education due to other factors

This sub-theme consists of three headings: inability to access education due to the siblings at home participating in DE at the same time, the fact that one or both of the parents are working, and the parents do not want their inclusive children to be seen by their peers and parents in the classroom during the DE. T2, one of the three teachers who thought that it was due to the lack of sufficient tools and time due to the other siblings participating in DE at the same time, said, “So, there are more than one child in a house; Those who go to high school, to secondary school... Obviously, in this case, preschool, especially the IS, is in the last row for education”. T1, one of the four teachers who thinks that one or both of the parents are working, stated that "My IS’s mother and father are also working. In this case, the child and his family do not participate the DE”. T10, one of the three teachers who think that parents want their children's disabilities not to be seen by their peers and their parents, stated that “So, DE is not very efficient for IS, for example my student is hyperactive. It is very difficult to keep him on the screen. I can't even make eye contact. When he is not paying his attention, you cannot get answers to the questions you ask. When family realized that turns off the screen and wants to exit". Another teacher T3 has stated, “There is no problem sending the IS to school, families come to the meetings during the formal education, but parents do not want to participate in DE. Because during the formal education the child is alone with me and his peers in the classroom; however, all parents witness the behavioral problems of the child in DE.

Teachers’ experiences regarding the similarities and differences between formal education and DE

From the theme of teachers’ experiences of similarities and differences between formal education and DE, two sub-themes were reached: (a) the similarities between formal education and DE, and (b) the differences between formal education and DE.

The similarities between formal education and DE

This sub-theme is in the form of similarities in the parts of the formal curriculum presented with visual aids, and the similarities of the IS’s participation to the activities in the course. T2, one of the six teachers who stated that there are similarities in the parts of the curriculum presented with visual aids, said, “In the classroom, sometimes we did activities on the smart board. We can also do them in computers in DE. In other words, similar things actually... ” T1, one of the four teachers who stated that there are similarities regarding their level of participation of the IS in the activities held in the course during the formal and DE, said, “The student who attends the class in formal education also participates in DE. The IS often cannot attend properly, but if formal education continued, he/she would probably come to school”.

The differences between formal education and DE

These differences regarding to inclusive student-teacher interaction, attention spans, providing physical prompt, responding to behavioral problems, and providing material support. T8, one of the three teachers who stated that there are differences in the interaction between the IS and the teacher, has stated, “... For example, we noticed and saw, at least when he was distracted in the classroom. We could intervene, but now from the screen we don't know, what is he doing, is he/she focusing at the
activity, is he/she listening to the teacher? We do not know about any of them. The attention span is probably short”. T9, one of the two teachers who stated that there are differences regarding the presentation of physical prompt, said, “Of course, it is not like face to face. There, if necessary, we provide prompts to the students and direct them. But in here we can't do it. We're telling the family to provide prompt to child, unfortunately it doesn't always happen as desired”. T7, one of the two teachers who stated that there are differences regarding the responding to behavioral problems, said “... For example, if the mother or father is next to the IS when he / she gets angry in the online classroom or exhibits a behavioral problem, we tell them about what they can do. But they also often don't understand, they don't know what to do. They can also behave completely wrong against to him/her. Then it may take time to get the child back to class again anyway. Sometimes it completely breaks off from the lesson anyway... ”. Stating that there are differences in providing material support, the teacher T6 said, “For example, we can find every material or sample in the classroom or we want it from the other class. Children have the opportunity to look and examine one by one. But in DE, we can only use what we have visually”.

**Teachers' experiences of peer interaction in the DE in terms of IS**

The theme of teachers' experiences of peer interaction in the DE for the IS is that both peer interaction and social skills decrease for the IS.

*Decrease in both peer interaction and social skills for the mainstreaming student*

This sub-theme includes those who think that peer interaction and social interaction skills are decreased. T1, one of ten teachers who thinks that it reduces peer interaction, said, “Of course, he inevitably interacts with his friends in the classroom is much more in formal education. That's why the child comes to class to socialize anyway. It is not possible to give these experiences in DE to IS.”.

**Teachers’ expectations for DE**

The theme of teachers' expectations for DE consists of two sub-themes: (a) expectations for the IS and (b) teachers' expectations in terms of professional development in DE regarding special education.

*Expectations for the IS*

This sub-theme consists of those who think that DE is not beneficial for IS. Accordingly, T1, one of ten teachers, said, “This practice is contrary to the nature of inclusion. It is not possible to include the child in this way. We cannot adequately provide academic knowledge to those students, because our knowledge is not enough. They come to school to be with their peers. DE does not help in this respect... ” Another teacher T9 has stated, “Or, these children should be given the opportunity to be with a small number of peers on certain days of the week. Frankly, I think it is necessary to take precautions and open schools as soon as possible in order to reduce developmental losses for both peers in a critical time like preschool”.

*Teachers' expectations in terms of professional development in DE regarding special education*

This sub-theme is in the form of those who think that a pre-training or support is necessary for their professional development related to special education in DE. T3, one of ten teachers who thought this way, said, “It is very difficult to provide special education, especially from a distance. In this sense, the MNE can provide a pre-training to preschool teachers. Because the normally developing child is okay to handle, but we really don't know what to do with the IS in this process”.

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DISCUSSION

As many people in the World have been infected with coronavirus disease, it has brought the DE back into the spotlight in the field of education. In this context, the DE has been activated in education services at all levels in Turkey (MNE, 2020). This unexpected transition has come with up some problems (Jeste et al., 2020). These problems can be listed as: inadequacy of teachers, stakeholders adaption to the DE, internet infrastructure, supplying technological equipment and using the system. These factors can lead to more critical consequences when it comes to individuals with special needs in early childhood, their teachers and their families, who continue their inclusive practices. This situation also created a need for this research to be carried out.

The findings of the study showed that the experiences of preschool teachers focused on the use of technology in the DE, family participation, peer interaction and expectations regarding DE. The results of studies on individuals with special needs during the pandemic in national and international literature are similar (e.g., Aishworiya & Kang, 2020; Constantino et al., 2020; Navas et al., 2021).

One of the findings, which is considered to be important in this study, is about teachers’ use of technology. Most of the teachers stated that they did not have any problems in using the DE system. Technology and technological equipment’s have been used frequently in the field of education in recent years. In the pandemic, the use of these tools has become more widespread (Goldschmidt, 2021). The reason why teachers consider themselves sufficient to use the system may be that in formal education, tools such as smart boards and computers are employed in classrooms and teachers are already familiar with using these technologies. Another reason for this situation is thought to be the courses related to instructional technologies that teachers took in their undergraduate period. When the findings were examined, it was seen that the teachers who took the instructional technologies course thought that they were sufficient to use the system with their pedagogical and technical background. In addition, teachers may have learned to use the system compulsorily due to the sudden transition to DE with the pandemic (Acar, Erbas & Eryaman, 2021; Kirmizigül, 2020; Kurt & Kurtoğlu-Erden, 2020).

In contrast, a small number of teachers said they still needed support in using the system. This situation is thought to have several reasons. Guernsey and his colleagues (2020) explained this situation as the fact that not everyone has the same technological equipment in DE carried out for the sustainability of students' education in many countries, and that factors such as inadequacies in the use of technology (such as internet connection) cause teachers to have problems using the system. However, it is thought that starting the process without giving pre-training to teachers about the use of the DE system causes some teachers to be insufficient to use the system even though they have technology knowledge and to be caught unprepared for the process (Kurt & Kurtoğlu-Erden, 2020).

Another remarkable problem with teachers’ use of technology is the lack of internet access and/or technological infrastructure. It is seen that this situation is related to the places where teachers work, regardless of their professional development. Teachers who participated in this research and worked in the countryside also stated that they still have problems accessing the internet. The fact that this problem can be experienced in places where internet infrastructure is still not sufficient throughout the country is supported by teachers’ opinions (Kirik, 2014). The opinions related to the technological infrastructure, which is another variable, are as follows. In cases where DE coincides with the same hour, technological equipment may be insufficient, a single technological device falls on more than one child, or some families do not have these devices at all. Similar research findings indicate that not every child or teacher has the same facilities to participate in DE (Iivari et al., 2020; Rose et al., 2020).

One of the findings of the study concerns the participation of the families. It is possible to evaluate participation in the process positively and negatively. A small part of the teachers stated that the participation of the families of the students with special needs increased in this period. Teachers stated that the reason for this was that their parents accompanied them during the lesson due to behavioral problems (such as not sitting in place) displayed by students with special needs during the DE. This situation is thought to be beneficial in terms of reinforcing the cooperation with the family
and their participation, which is one of the core factors in the success of the inclusive practices. In this process, it is stated that family participation is beneficial for all stakeholders involved in inclusive practices (children with special needs, families, peers and teachers) (Salend, 2005). These benefits enable students to increase their academic success and different skills. The increase in the awareness of the parents of the typical developing peers and the change in their attitudes, the psychological well-being of the families of children with special needs and the easier acceptance of the inadequacy can be listed as increasing the professional development of teachers in planning and conducting the process (Salend, 2005). In this context, the participation of families in the education can be seen as a positive contribution. In addition, parents’ involvement in the process enables them to observe their children's various skills (Gürgür, 2020). So, it is clear that family participation is very important in both formal and DE.

However, another group of teachers stated that families did not actively participate in educational activities during this period. These teachers opinion, parents did not participate in activities that required their participation during online classes, and they could not be an active participant in the points where they should direct their inclusive students. Participation of families in this process is not considered at a full and fulfilling level. Family participation, which is also mentioned in the definition of inclusive practices, is incompatible with this stated participation. However, the DE increases the instructor role of families regarding the education of their children with special needs compared to formal education (Mengi & Alpdoğan, 2020). In this period, the family's inability to take an active role in the educational processes reduces the education quality of their children and causes the developmental difference between them and their peers to widen further. Such a loss experienced in early childhood, which is one of the most critical periods for development, can lead to situations that cannot be compensated in the future.

Another view of teachers regarding family participation is that families have passed the DE system without any preparation. Families have suddenly transitioned to this process, just like teachers and students. This situation caused the families not to know how to adapt the DE system to the education of their children. According to Şenol and Yaşar (2020), parents' inadequacy of knowledge regarding the education of their children with special needs, the lack of integrating technology into education and the inadequacy of parent-teacher communication prevent families from actively participating in the process. Similarly, teachers state that the way to overcome these obstacles is for parents to make more efforts regarding their children's education. Therefore, the responsibilities of the families regarding the education of their children increased more in this period. However, the participation rates of families of children with special needs have also decreased. Another reason for families not being able to actively participate in the process is that one or both parents are working and other siblings participate in the DE at the same time. This situation indicates that in terms of the nature of the DE, it is not suitable for the individuals with special needs.

Another finding regarding family participation in this study is that parents do not participate in the DE because they do not want disabilities of their children to be seen by their peers and parents. The teachers stated that they could interact with the children in the classroom during the formal education and that peers could better tolerate the differences of the students with special needs without witnessing of other families. They emphasized that the fact that families of typical developing child witnessed the differences and disabilities of children in the DE caused the families of children with special needs to be disturbed by this situation and not participate in the process. This suggests that parents still need support in coping with disability in the early childhood period when disability is first encountered, and when this support is not sufficient, they tend to hide their inadequacies. This situation brings to mind the processes related to the acceptance of disability.

One of the themes obtained in this research is the similarities and differences between formal and DE in terms of inclusive practices. Teachers stated that there were similarities between the two education processes in terms of presenting the curriculum to students with special needs using visual supports and participation in activities. The reason may actually be that the widespread use of technology (smart board, e.g.) in formal education and the teachers’ use of similar technologies in the
DE may have caused these two educational processes to be compared to each other. The teachers stated that the level of similarity regarding participation in the lesson was at the same level in the formal education of the student who continued the inclusive practices. While this level of participation was not at the desired level in formal education, it was also at a similar level in DE. This situation is consistent with the results of studies in which inclusive practice was carried out formal (Bakkaloglu et al., 2018). However, teachers stated that there were differences between the two educational processes in the attention span of students, providing physical prompts, interfering with behavioral problems and providing material support. Teachers stated that the attention span of the student with special needs who continues the inclusive practices in the DE is shorter than the formal education. They also explain that when the student's attention is distracted, the teacher can intervene more easily in formal education. Considering the characteristics of students with special needs, it is known that the first condition for acquiring skills is to attract attention (Alberto & Troutman, 2013). It is thought that while it will be difficult for students, who develop typical in the DE, to pay attention to the activity being studied, it will be even more difficult to concentrate the attention of special needs students. Teachers stated that the stages of activities that the student cannot perform during the DE can be performed with physical prompt of teachers during formal training. Pre-behavioral stimuli (such as prompts) are important for individuals with special needs to acquire skills. Due to its nature, the DE does not allow the effective use of pre-behavioral stimuli. This situation is consistent with similar research findings. In addition, teachers stated that they could better intervene in problem behaviors in formal education. The process of changing behavior is a process that requires control and follow-up on the student (Plötz et al., 2012). It is important to implement this process face to face in a systematic way. In this context, it seems difficult for teachers to establish behavioral control remotely. Finally, teachers stated that while individualizing students' activities, they could use different materials more effectively in formal education. While it is possible to diversify the materials suitable for the performance levels of the students by the teachers in formal education; the use of materials in the DE is only possible with technologies offered by computers. This situation may prevent teachers from individualizing the activities in accordance with the students who continue the inclusive practice.

Another finding is teachers' experiences of peer interaction in terms of IS in the DE. Teachers stated that the interactions of IS during the DE decreased with their peers. One of the important conditions for the success of inclusion is the acceptance of the IS by their peers, increasing their social interactions and increasing their class participation in these ways (Amado et al., 2013; Simplican et al., 2015). In this context, the DE negatively affects the inclusion practice.

One another finding of the study is the expectations of teachers about DE. This finding is consistent with similar research findings. Teachers expressed their expectations in terms of their professional development related to special education during the DE and stated that their professional development in special education should be increased. At this point, it is thought that if the DE will be carried out with the inclusive practices, pre-training and preparatory trainings should be carried out on how teachers will work with special needs students. In this context, teachers stated that support education services should be included in the DE in order to minimize the developmental losses of children with special needs in the DE. The inclusive practices is defined as full-time education with their peers or part-time in special education classes by providing support education services to individuals in need of special education in order to ensure that they interact with other individuals at all types and levels and achieve their educational goals at the highest level (SESR, 2018). As can be understood from the definition, it will not go beyond a waste of time for students with special needs to receive education without providing support education services in the same classroom (Gürgür, 2020). Support education services are in three types: special education counseling, co-teaching and resource room, and these support types can be used alone or together (Friend et al., 2010). However, the results of the researches carried out on inclusive practices in the national literature and examining teacher opinions show that support education services are not carried out at the level they should be (Bakkaloglu et al., 2018; Özdemir, 2010). The fact that support education services, which are considered indispensable even in formal education, do not exist in the DE negatively affects the early education, which is one of the most critical periods for children with special needs. Another point to be discussed is that the DE of teachers is not beneficial for students continuing the inclusive practices.
By taking necessary precautions, it is considered that students with special needs continue their formal education without further developmental losses. In other words, preschool teachers state that the characteristics of DE are against individuals with special needs and the nature of special education. Children with special needs should receive systematic and intensive training from specialists trained in the field of special education with appropriate methods, materials and adaptations according to their individualized education programs (IEP). They need formal training due to their inadequacy in some skills and problem behaviors. However, the compulsory DE has already led to the complete elimination of supports that cannot be carried out at the level it should be. This view is also consistent with the findings of research conducted with individuals with special needs in the DE (Aishworiya et al., 2020; Navas et al., 2021). Finally, the participating group of this research consists of teachers working in different provinces and different schools. This difference is important to see if teachers' views and experiences regarding the DE differ according to where they live. In addition, it is thought that the participation of teachers in this research from different places is important for the maintenance of the findings.

Implication of Study

- One of the results obtained in this study is that teachers have some problems in using the system due to a rapid transition to the DE. For this reason, if the process will continue, it is recommended to make a preliminary preparation for the DE and to inform all stakeholders before the next training period.

- Another result obtained is the experiences of teachers regarding infrastructure problems. Therefore, it is recommended to complete the shortcomings related to infrastructure in order to make DE equally accessible to all stakeholders.

- With the transition to the DE, the importance of family role and participation in the inclusion education of individuals with special needs has been understood once again. For this reason, it is recommended to expand family education programs for the families of children with special needs.

- Whether it is continued through formal or DE, teachers need support in preparing IEP, determining appropriate teaching methods, adapting teaching strategies and materials when training with special needs students. When support education services are not provided, inclusion will not go beyond sharing the classroom. In this context, it is recommended to expand the support education services.

- Another finding that emerged in this study is related to the courses that teachers took in special education and technology fields during their undergraduate education. In the study, it was observed that teachers who took courses on the use of technology in undergraduate education adapted more easily to the DE. Considering that technology will be used more widely in education processes in the following years and it is necessary to be prepared for a similar pandemic again, it is thought that it is important to enrich the course content on technology use.

- In addition, it is seen that taking courses in undergraduate education of preschool teachers related to the field of special education positively affects the adaptation of teaching and materials, individualization and coping with problem behaviors while working with students with special needs. It is thought that enriching the course content in undergraduate education and adding more compulsory courses related to the field of special education will increase the success of inclusive practices in the future.
REFERENCES


Kaya, N. G. (2020). “Pandemi Döneminde Özel Eğitim Gereksinimi Olan Engelli Öğrenciler ve Uzaktan Eğitim”, 5th International Congress on Social Sciences, Taras Shevchenko University, Ukraine


The Effect of Argumentation on Seventh Grade Students' Scientific Epistemological Beliefs and 21st Century Skills

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Abstract

The aim of this study is to examine the effect of argumentation over current teaching approach on scientific epistemological beliefs and 21st century skills of seventh grade students. This is a quasi-experimental design with pre-test and post-test control group. The sample of the study was composed of 79 seventh grade students (38 experimental; 41 control group) from two intact classes of an urban middle school instructed with the same teacher. The teaching methods were randomly assigned to the classes. The experimental group treated with argumentation, the control group treated with the current teaching approach without argumentation. As data collection tools; Scientific Epistemological Beliefs Scale and 21st century skills scale were used. Multivariance Analysis of Variance (MANOVA) was used for data analysis. The results showed that argumentation and the current teaching approach had a similar effect on students’ scientific epistemological beliefs and 21st century skills.

Keywords: Scientific Epistemological Beliefs, 21st Century Skills, Argumentation, Middle School Students

DOI: 10.29329/ijpe.2022.467.11
INTRODUCTION

Scientific and technological developments impact science teaching. Jerald (2009) stated that in addition to the academic knowledge and skills, students need different knowledge and skills in order to adapt to jobs. These are 21st century skills and they emerged with recent changes in the world. Some institutions such as The Partnership for 21st Century Skills [P21], National Research Council [NRC], North Central Regional Education Laboratory (NCREL) and Metiri Group (2003) evaluated and classified 21st century skills. Students’ 21st century skills classification created by Kang, Heo, Jo, Shin, and Seo (2010), consists of three domains: cognitive, affective and sociocultural domains. Cognitive domain skills are consisting of knowledge management, knowledge structuring, knowledge usage skills and problem solving skills. Knowledge management skills require skills such as inquiry, using tools, using resources; knowledge structuring skills include reasoning skills and critical thinking skills; knowledge usage skills include judgement skills, evaluation skills and solution generating skills; problem solving skills need creative thinking skills. Affective domain skills are skills towards self-identity, self-worth, self-efficacy, self-responsibility and social membership. Self-identity is related to the individual's self-perception; self-worth skills are related to honesty, reliability, and awareness; self-efficacy includes skills to decide on the goal and to define personal obligations; self-responsibility includes self-responsibility and assertiveness skills. Sociocultural domain skills include social membership skills, social sensitivity skills, socialization skills and social fulfillment. Social membership is related to the awareness of the society’s value judgment, hosting a sense of community and citizenship; social sensitivity includes understanding and tolerance towards cultures; socialization skills consists of communication skills; social fulfillment skills include skills such as being able to lead, and being able to work in teams (Kang, Heo, Jo, Shin, & Seo, 2010).

In the 21st century, people should have technological skills, cooperation and communication skills, self-management skills and leadership skills. Also, they should be open to new ideas, responsible and socially and culturally sufficient. (Eryilmaz & Uluyol, 2015). In addition to these, people should think creatively and critically and so produce solutions to problems by having the ability to cooperate. It is vital to develop students’ 21st century skills because their 21st century skills are relatively low level (Fauziah & Feranie, 2018). The other reason for developing students’ 21st century skills is that students need to be successful in business life and possess the characteristics of the century. As stated in the documents (such as P21; NRC, 2011), the development of 21st century skills could help the development of countries and solve real life problems.

Therefore, one of the goals of this research is to improve students’ 21st century skills. Argumentation was used to improve 21st century skills of students. Jiménez-Aleixandre and Puig (2012) discussed the relationship between argumentation and critical thinking. They suggested that critical thinking is an important component in evaluating evidence. Another reason for using argumentation in the present study is that it is one of the approaches used in the literature to improve students’ 21st century skills. For example, Küçük-Demir and Isleyen (2015) determined that the argumentation positively affected the creative thinking skills of ninth grade students with a single group pre-test and post-test experimental design. Nejmouei (2019) stated that the experimental group students, who were asked to write with critical thinking skills, had a better level of ability to use more reliable evidence, mention counter arguments, support the results, and maintain the logical flow of ideas compared to the control group students, who were asked to write without specifying these skills. Komara and Sriyanto (2018) stated that the constructivist discussion is effective in helping students to develop their critical thinking skills while writing texts containing argumentation elements. Kumdang, Kijkuakul, and Chaiyasith (2018) found that 10th grade students develop creative thinking by argument-oriented inquiry. Pei, Zheng, Zhang, and Liu (2017) found that students with strong critical thinking skills performed better than the students with weak critical thinking skills in terms of relevance, openness, logic, and flexibility of argumentative writing.

As can be seen in the above studies, only one or a few 21st century skills are examined, the number of studies examining the development of middle school students’ 21st century skills are also
rare. Therefore, in the present study, unlike other studies, the development of 21st century skills as a whole will be examined and the research will be carried out with seventh grade students.

Shaakumeni (2019) stated that while developing 21st century skills, epistemological beliefs should be developed. Thus, in the present study, the development of epistemological beliefs was investigated. Individuals’ perspectives and views towards science are a reflection of the epistemological beliefs. Scientific epistemological beliefs have an important place in terms of students' understanding of science and their ability to interpret scientific knowledge (Lederman, 1992). Epistemological beliefs can be defined as all views on the aim of science, the sources of scientific knowledge, and the changeable nature of knowledge (Elder, 1999).

Schommer proposed the following epistemological beliefs dimensions. These dimensions are as follows: simple knowledge, certain knowledge, quick learning and innate ability (Schommer, 1994). Simple knowledge dimension includes beliefs about whether knowledge is in a simple or interconnected complex structure. Certain knowledge dimension includes beliefs about whether knowledge is certain or not certain. Quick learning dimension includes beliefs that the learning occurs immediately, or gradually. Innate ability dimension includes belief that learning is due to the innate abilities of individuals or can be improved with experiences, and can be learned by everyone. Schommer (1994) stated that an individual can be in different developmental stages of these four dimensions independent from each other. In other words, while individuals have sophisticated beliefs in some dimensions, they may have unsophisticated beliefs in some other dimensions at the same time. Hofer and Pintrich (1997), like Schommer (1990) argued that epistemological beliefs consist of independent dimensions. However, unlike Schommer (1990), they stated that epistemological beliefs are formed from the nature of knowing and nature of knowledge and that the epistemological beliefs of the individuals vary according to the field (discipline). They suggested that epistemological beliefs consist of dimensions of the certainty of knowledge, simplicity of knowledge, source of knowing, and justification of knowing.

Conley, Pintrich, Vekiri, and Harrison (2004), examined 5th grade students' epistemological beliefs in terms of source, judgment, development, and certainty dimensions. The source dimension includes a continuum from obtaining information from a source other than the student to obtaining information from the student himself/herself. The judgment dimension indicates the degree to which students’ usage of their newly learned information in the judgment process. The certainty dimension includes a continuum from the belief that a question has only one answer to the belief that it has more than one answer. The development dimension includes a continuum that moves from the belief that knowledge is certain, to belief that knowledge can change and develop in line with newly obtained evidence. These dimensions are differing from the dimensions determined by Schommer (1994) in that they are directed to a specific discipline. Discipline-focused epistemological beliefs have a great effect on academic achievement (Muis, Bendixen, & Haerle, 2006). Tsai, Ho, Liang, and Lin (2011) stated that examining students' epistemological beliefs in a particular discipline is of great importance. Buehl and Alexandre (2006) stated that epistemological beliefs are shaped in terms of the different domains. For this reason, epistemological beliefs about the discipline have come to the fore. Therefore, in this study, it is aimed to determine and develop students' scientific epistemological beliefs.

It is important to study the development of students' scientific epistemological beliefs for several reasons. One reason is that students' epistemological beliefs affect their academic success. For example, Dorfner, Förtsch, Germ, and Neuhaus (2018) concluded that students who were taught with epistemic activities under the framework of argumentation had higher success. Another reason is that it is important to determine the epistemological beliefs of middle school students, because there are very few studies in these age groups (Bendixen, 2016). For these reasons, in the present study in order to develop students’ epistemological beliefs, argumentation was used. The reason this is used is because argumentation is associated with epistemological beliefs. For example, Mateos, Cuevas, Martin, Martin, Echeita, & Luna (2011) stated that the epistemological, argumentative reading and writing beliefs held by psychology graduates are interrelated. Mason and Scirica (2006) found that after controlling the content knowledge and interests of eighth grade students, the participants having
evaluative level of epistemological understanding formed higher arguments, counter arguments and rebuttal than the participants at the pluralist level. Some studies stated that epistemological understanding is predictive of students' argumentation skills (Schommer-Aikins & Hutter, 2002; Nussbaum, Sinatra & Poliquin, 2008; Khishfe, 2012; Liu & Roehrig, 2019; Noroozi, 2018; Şengül, Enderle, Schwartz, 2020). However, some studies have not proven that students' epistemic beliefs have an effect on argumentation (Noroozi & Hatami, 2018). The other reason is that it is one of the approaches used in the literature to develop epistemological beliefs. For example, Schommer-Aikins and Hutter (2002) emphasized that the inclusion of controversial topics in the curriculum can mutually support the development of epistemological beliefs. Liu and Roehrig (2019) stated that with a 3-year professional development program on climate change, science teachers have similar epistemological beliefs about climate change, but they differ in some aspects in terms of the expertise of scientists and the reliability of scientific evidence. They also found that there were differences between teachers' personal epistemology about science and their epistemological beliefs about climate science. Iordanou (2016) found that argumentation practices contributed to the development of students' epistemological beliefs.

The Argumentation, developed by Keys, Hand, Prain, and Collins (1999), is one of the inquiry-based science learning approaches. Toulmin (1958) defined argumentation as the process of making conclusions by providing the warrants for an idea or a hypothesis, supporting claims with data. Argumentation is not an attempt to reach an absolute truth. Argumentation is the process of testing more than one existing knowledge using claims and evidence (Toulmin, 1958). In the present study, Toulmin’s argumentation approach was used. The Toulmin’s argumentation includes the setting a claim, giving reasons to justify the claim, to use evidence and to refute counter-claims (Erduran, Simon, & Osborne, 2004). Recent argumentation studies are related to the construction of scientific knowledge and the development of mental activities. Also, recent learning and teaching approaches aim to improve students' scientific language skills, especially in science. From this point of view, argumentation also helps to develop knowledge, which is of great importance for speeches in a scientific language (Erduran, Ardac, & Yakmaci-Guzel, 2006). In argumentation, students use their previous knowledge for putting reasons that provide support for their views and make an effort to justify these views. Students who have opposing ideas express their views openly, explain their doubts and express alternative opinions. All students work like scientists; i.e. they form their warrants and support to prove their claims. In this way, they reconstruct their scientific knowledge (Driver, Asoko, Leach, Mortimer & Scott, 1994).

Scientific argumentation is not a simple argument or debate. The main purpose of argumentation is to convince the other by revealing acceptable ideas (Clark & Sampson, 2007). Argumentation is a logical activity, the ideas created by individuals on their own are not enough, arguments should reflect the views of different people. The purpose of scientific argumentation is to verify or refute the views of individuals. Scientifically, argumentation is the process of linking claims and data with justifications in experimental and theoretical terms (Jimenez-Aleixandre & Erduran, 2007). According to Driver et al. (2000), one of the main purposes of using argumentation in science teaching is to develop an understanding of scientific epistemology.

When the above-mentioned studies are examined, the argumentation could be helpful for the development of students’ 21st century skills and epistemological beliefs because students form a scientific question, give priority to the evidence while answering the question, evaluate their own views in the light of other groups’ views, and critically examine other explanations while determining the backing and rebuttal of their claims. Increasing the emphasis on argumentation in teaching environments will make it easier for students to adapt to be active, collaborative, competitive and innovative work environments.

Rationality: In science education, it has been found that even in inquiry, students do not use sufficient data and backings to support their claims and have difficulty in reasoning between alternative theories (Kelly, Druker, & Chen, 1998; Watson, Swain, & McRobbie, 2004). Some studies
revealed that students could overcome these difficulties with argumentation (Acar, Turkmen, & Roychoudhury, 2010; Duschl & Osborne, 2002).

Scientific epistemological beliefs are an important element of students' learning (Hofer, 2001). Studies show that people should have sophisticated epistemological beliefs in order to construct their knowledge (Jehng, Johnson, & Anderson, 1993; Muis & Franco, 2009). For 21st century people, it is not only important to reach the information, but also how to analyze and use the information (Wagner, 2008). Individuals are not only expected to have knowledge, what is expected from individuals is to be constantly open to learning, to look critically, to adapt to innovations, to cooperate, to bring solutions to problems, in short, to have 21st century skills (Olkun & Toluk, 2003). Also, Lobczowski, Allen, Firetto, Greene & Murphy (2020) stated that argumentation will help students to gain 21st century skills and such studies are needed. This research is important in terms of filling this gap in the literature.

The purpose of this study is to examine the effect of argumentation on 7th grade students' scientific epistemological beliefs and 21st century skills. The research problems are as follow:

1. Is there a statistically significant difference between the pre-test scientific epistemological beliefs score of the control and experimental group students?

2. Is there a statistically significant difference between the post-test scientific epistemological beliefs score of the control and experimental group students?

3. Is there a statistically significant difference between the pre-test 21st century skills score of the control and experimental group students?

4. Is there a statistically significant difference between the post-test 21st century skills score of the control and experimental group students?

METHOD

Research Model

In this study, a quasi-experimental design with pre-test and post-test control group was used (Fraenkel & Wallen, 2000). In the study, there are two study groups, the experimental group was treated with argumentation and the control group was treated with the learning-teaching methods applied in the current science curriculum, which includes constructivist approach such as 5E learning model. In order to determine the effect of two different teaching methods on students’ epistemological beliefs, the Scientific Epistemological Belief Scale was administered to both groups as a pre-test and a post-test. In order to determine the effect of the treatments on students’ 21st Century Skills, 21st Century Skills Scale was applied as a pre-test and post-test to the both groups.

Participants

The sample of this study was composed of seventh grade students from two intact classes of a middle school. The experimental group was composed of 21 boys and 17 girls and the control group was composed of 21 boys and 20 girls, totally 79 students. The groups were randomly assigned as a control and an experimental group. The groups were instructed with the same teacher.

Implementation

It has been determined that the recommended time for the unit of Reflection and Light Absorption in the Mirrors in the science curriculum is 20 lesson hours and this is four weeks (Ministry of National Education [MoNE], 2018). The time required for introductory activities for the students to get used to the argumentation and to get to know the teaching method was set as 2 class hours. A total
of 4 lesson hours was allocated for the pre-test and post-tests. Control group and experimental group activities were carried out by the science teacher, the first author. The first author has over 10 years of professional science teaching experience and received training in argumentation. Ethics committee approval was obtained for the implementation of the study.

**Control Group**

In the control group, lessons were planned according to the 5E learning model. A sample lesson was carried out as follows: In engage; teacher asked "How do you see yourself when you look at the inner surface of a spoon?". Then, the teacher asked "How do you see yourself when you look at the outer surface of a spoon?". Students discussed the questions, the teacher revealed the students’ prior knowledge and knowledge gaps, thus, students’ interest for the topic was fostered. In explore; students were required to examine the activity photos in the textbooks. They discussed the similarities and differences among photos. Then, in the explain phase, teacher asked the following questions respectively. "How was the image formed in the flat mirror in the photo you are examining?", "How was the image formed in the hollow mirror in the photo you are examining?", “How is the image formed in the bump mirror in the photo you are examining?”. After receiving the necessary explanations from the students, in elaborate phase, to deepen "How can submarines see the sea?” and "What difficulties would we have faced without mirrors?” questions were asked. In evaluation phase, in order to evaluate the students, students did the activity in the textbook.

**Experimental Group**

The activities were prepared by considering the argumentation model of Toulmin. While forming the activities, the opinions of academicians who are experts in argumentation were taken and then necessary corrections were made in line with the feedback received. The pilot study of the teaching activities was carried out with students who were in the same school with the study groups but were studying in another section. After the pilot study, the title "Let's Observe” in the first part of Activity 1 was changed to "Let's test our claim".

In the experimental group, a sample lesson was carried out as follows: the teacher asked "What are the types of mirrors we use in our daily life?” to attract students' attention to the lesson. Then, teacher asked "Are the mirrors in stores or crossroads same as the mirrors we use in our house?” to increase students' motivation towards the lesson and to strength the students’ attention. The teacher distributed worksheets to create a scientific discussion environment without confirming the correctness or falsity of the students' answers. In activity 1, the worksheet includes the following question “Can you reverse the image of an object using a flat mirror, concave mirror, or bulge mirror?” The students argued with their groupmates and formed a claim. Then, each group defended and made an explanation with the backing of their claim. Each group used their rebuttal for counter arguments that could come from other groups, and tried to understand the topic. The teacher asked further questions such as "Why did you set this claim?", "What data did you use to support your claim?", “Have any other claims made within the group?”, "What data did you use to refute the other groups’ opposing claims?”. Then, teacher asked "Has your claim changed at the end of the discussion?” At the end of the activity, the process was evaluated by distributing a self-assessment form to the students.

**Data Collection Tools**

The Scientific Epistemological Beliefs Scale developed by Elder (1999) and adapted into Turkish by Acat, Tüken, and Karadağ (2010), and the 21st century skills scale adapted into Turkish by Karakaş (2015) were used as data collection tools in this study.
Scientific Epistemological Beliefs Scale

Elder (1999)'s scientific epistemological belief scale consists of four factors. These are: I: Certainty: Knowledge is certain; II: Evolving: Knowledge is less certain, changeable, evolving; III: Authority: Knowledge comes from authority; IV: Reasoning: Knowledge emerges from reasoning, thinking and testing. Acat et al. (2010) adapted the scale to Turkish as I: Authority and accuracy, II: Knowledge production process, III: Source of knowledge, IV: Reasoning and V: Change of knowledge.

Scientific Epistemological Beliefs Scale is a five-point Likert type and consists of 25 items. Higher scores from each dimension indicate sophisticated belief, lower score indicate unsophisticated belief. The internal consistency coefficient of the scale was between 0.57 and 0.86 in the dimensions, and 0.82 for the overall scale (Acat et al., 2010).

21st Century Skills Scale

The scale developed by Karakaş (2015), and consists of three main dimensions (cognitive, affective and sociocultural) and 12 sub-dimensions. Cognitive dimension; knowledge management skill, knowledge structure skill, knowledge usage skill, problem solving skill; Affective dimension; self-identity, self-worth, self-management, self-responsibility; Sociocultural dimension; social membership, social sensitivity, socialization skill, social performance sub-dimensions.

The 21st century skills scale is a five-point Likert type. Higher score from each dimension indicates sophisticated skill, lower score indicates unsophisticated skill. The internal consistency coefficients, Cronbach alpha coefficients of each sub-dimension of the scale was .77, .70 and .67, respectively (Karakaş, 2015).

Data Analysis

MANOVA was used for analyzing the sub-problems of the study.

RESULTS

Findings on Scientific Epistemological Beliefs

The Scientific Epistemological Belief Pre-test Scores of the Control and Experimental Group Students

Before performing MANOVA, the assumptions were checked and the assumptions were not violated. For testing multivariate normality assumption, skewness and kurtosis values were checked and they are given in Table 1. Hair, Black, Babin & Anderson (2010) stated that skewness values of between -2 to +2 and kurtosis values of between -7 to +7 is considered as normal.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authority and accuracy(CG)</td>
<td>2.26</td>
<td>0.89</td>
<td>0.930</td>
<td>0.717</td>
</tr>
<tr>
<td>Knowledge production process (CG)</td>
<td>3.47</td>
<td>0.55</td>
<td>-0.647</td>
<td>0.088</td>
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<tr>
<td>Source of knowledge(CG)</td>
<td>2.46</td>
<td>0.93</td>
<td>0.949</td>
<td>0.228</td>
</tr>
<tr>
<td>Reasoning (CG)</td>
<td>4.07</td>
<td>0.71</td>
<td>-0.553</td>
<td>-0.332</td>
</tr>
<tr>
<td>Change of knowledge (CG)</td>
<td>3.79</td>
<td>0.93</td>
<td>-0.975</td>
<td>0.880</td>
</tr>
<tr>
<td>Authority and accuracy (EG)</td>
<td>2.17</td>
<td>0.92</td>
<td>0.802</td>
<td>-0.184</td>
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<tr>
<td>Knowledge production process(EG)</td>
<td>3.73</td>
<td>0.49</td>
<td>-0.342</td>
<td>-0.184</td>
</tr>
<tr>
<td>Source of Knowledge(EG)</td>
<td>2.51</td>
<td>0.76</td>
<td>0.194</td>
<td>-0.609</td>
</tr>
<tr>
<td>Reasoning (EG)</td>
<td>4.18</td>
<td>0.66</td>
<td>-1.08</td>
<td>1.597</td>
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<tr>
<td>Change of knowledge (EG)</td>
<td>3.95</td>
<td>0.83</td>
<td>-0.498</td>
<td>-0.498</td>
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</table>
For testing homogeneity of covariance assumption, Box’s M test value indicated that the observed covariance matrices of the dependent variables are equal across groups (F=0.716, p>0.05). Students’ epistemological beliefs scores are independent from each other so the independency assumption was met. One-way between groups MANOVA results showed that there was no statistically significant difference between the scientific epistemological belief pre-test scores of the control and experimental group students (F(5, 73) =1.22, p=0.309 Wilks’ Lambda= 0.923).

The Scientific Epistemological Belief Post-Test Scores of the Control and Experimental Group Students

Before analysis, the assumptions of MANOVA were checked and were met. Like previous section, multivariate normality assumption was tested and skewness and kurtosis values are given in Table 2. Hair et al. (2010) stated that skewness values of between -2 to +2 and kurtosis values of between -7 to +7 is considered as normal.

<table>
<thead>
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<th>Mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
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<td>Authority and accuracy(CG)</td>
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<td>0.86</td>
<td>1.259</td>
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<td>Knowledge production process (CG)</td>
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<td>-0.438</td>
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<td>Change of knowledge (CG)</td>
<td>4.01</td>
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</tr>
<tr>
<td>Authority and accuracy (EG)</td>
<td>2.12</td>
<td>0.78</td>
<td>0.636</td>
</tr>
<tr>
<td>Knowledge production process(EG)</td>
<td>3.61</td>
<td>0.50</td>
<td>-0.909</td>
</tr>
<tr>
<td>Source of Knowledge(EG)</td>
<td>2.75</td>
<td>0.64</td>
<td>0.207</td>
</tr>
<tr>
<td>Reasoning (EG)</td>
<td>4.23</td>
<td>0.68</td>
<td>-2.10</td>
</tr>
<tr>
<td>Change of knowledge (EG)</td>
<td>3.90</td>
<td>0.82</td>
<td>-0.655</td>
</tr>
</tbody>
</table>

For testing homogeneity of covariance assumption, Box’s M test value indicated that the observed covariance matrices of the dependent variables are equal across groups (F=0.865, p>0.05). Students’ epistemological beliefs post-test scores are independent from each other so the independency assumption was met. MANOVA results showed that there was no statistically significant difference between the scientific epistemological belief post-test scores of the control and experimental group students (F(5, 72) = 0.534, p=0.750, Wilks’ Lambda= 0.964).

Findings on 21st Century Skills

The 21st Century Skills Pre-Test Scores of the Control and Experimental Group Students

The assumptions were met. Multivariate normality assumption was tested and skewness and kurtosis values are given in Table 3. Hair et al. (2010) stated that skewness values of between -2 to +2 and kurtosis values of between -7 to +7 is considered as normal.

<table>
<thead>
<tr>
<th>Mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive (CG)</td>
<td>3.62</td>
<td>0.66</td>
<td>-1.042</td>
</tr>
<tr>
<td>Affective (CG)</td>
<td>4.06</td>
<td>0.73</td>
<td>-1.866</td>
</tr>
<tr>
<td>Sociocultural (CG)</td>
<td>3.77</td>
<td>0.68</td>
<td>-1.113</td>
</tr>
<tr>
<td>Cognitive (EG)</td>
<td>3.77</td>
<td>0.58</td>
<td>-1.436</td>
</tr>
<tr>
<td>Affective (EG)</td>
<td>3.20</td>
<td>0.43</td>
<td>0.489</td>
</tr>
<tr>
<td>Sociocultural (EG)</td>
<td>3.91</td>
<td>0.56</td>
<td>-0.433</td>
</tr>
</tbody>
</table>
For testing homogeneity of covariance assumption, Box’s M test value indicated that the observed covariance matrices of the dependent variables are equal across groups (F=1.087, p>0.05). Students’ epistemological beliefs post-test scores are independent from each other so the independency assumption was met. MANOVA results showed that there was no statistically significant difference between the 21st century skills pre-test scores of the control and experimental group students (F(3, 75)=0.712, p=0.548, Wilks’ Lambda= 0.972).

The 21st Century Skills Post-Test Scores of the Control and Experimental Group Students

The assumptions of MANOVA were met. Like previous section, multivariate normality assumption was tested and skewness and kurtosis values are given in Table 4. Hair et al. (2010) stated that skewness values of between -2 to +2 and kurtosis values of between -7 to +7 is considered as normal.

Table 4 Descriptive 21st century post-test scores of control group (CG) and experimental group (EG) students

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive (CG)</td>
<td>4.10</td>
<td>0.80</td>
<td>-2.049</td>
<td>4.586</td>
</tr>
<tr>
<td>Affective (CG)</td>
<td>3.96</td>
<td>0.63</td>
<td>-1.203</td>
<td>2.367</td>
</tr>
<tr>
<td>Sociocultural (CG)</td>
<td>3.63</td>
<td>0.54</td>
<td>-0.456</td>
<td>-0.475</td>
</tr>
<tr>
<td>Cognitive (EG)</td>
<td>3.83</td>
<td>0.46</td>
<td>-0.352</td>
<td>0.021</td>
</tr>
<tr>
<td>Affective (EG)</td>
<td>4.21</td>
<td>0.39</td>
<td>-0.598</td>
<td>0.272</td>
</tr>
<tr>
<td>Sociocultural (EG)</td>
<td>4.01</td>
<td>0.48</td>
<td>0.064</td>
<td>-0.439</td>
</tr>
</tbody>
</table>

For testing homogeneity of covariance assumption, Box’s M test value indicated that the observed covariance matrices of the dependent variables are equal across groups (F=1.007, p>0.05). Students’ epistemological beliefs post-test scores are independent from each other so the independency assumption was met. The results showed that there was no statistically significant difference between the 21st century skills post-test scores of the control and experimental group students (F(3, 74)= 1.229, p= 0.305, Wilks’ Lambda= 0.953).

DISCUSSION AND CONCLUSION

The Effect of Argumentation on Students’ Scientific Epistemological Beliefs

The result of the study showed that no significant difference was found between pre-test scientific epistemological beliefs of the experimental and control group students. In other words, according to the pre-test results, the experimental and control group students have similar characteristics in terms of their scientific epistemological beliefs. After instruction, there was no significant difference between the post-test scores of control and experimental group students. Thus, it could be stated that argumentation did not affect students' scientific epistemological beliefs. While the present study result is similar to various studies (Noroozi & Hatami, 2018; Nussbaum & Bendixen, 2003), it differs with some studies (Noroozi, 2018; Schommer-Aikins & Hutter, 2002).

The reason that there was no significant difference in terms of scientific epistemological beliefs between the groups may be that the implementation took a short period of four weeks. Carey, Evans, Honda, Jay, and Unger (1989) stated that it is difficult to change students’ epistemological beliefs. Similarly, Schommer (1994) and Conley et al. (2004) stated that it will take time for students to develop their scientific epistemological beliefs. In addition, the fact that the students did not sufficiently do research from various sources such as textbooks and internet and did not take an active role in the argumentation may have negatively affected the development of their scientific epistemological beliefs. The fact that the timid students in the classroom did not participate in these discussions too much may have negatively affected the development of their epistemological beliefs. On the other hand, because the current program applied in the control group is based on inquiry-based teaching, the scientific epistemological beliefs of the control group students may have developed.
Some studies show that students’ epistemological beliefs can be improved by inquiry-based teaching methods (Conley et al., 2004).

Another result of the study is that the students showed different sophisticated levels in terms of scientific epistemological beliefs in different dimensions. This result supports that students’ scientific epistemological beliefs may be at different sophistication levels for different dimensions (Deryakulu, 2004; Schommer, 1990; Schommer, 1994; Songer & Linn, 1991; Yenice & Ozden, 2013). Buehl, Alexander, and Murphy (2002) stated that according to the discipline-oriented epistemological belief, individuals believe that knowledge in science is more absolute and unchangeable than in social sciences. This is similar to the present study in that students got the lowest score in the authority and accuracy dimension. Ku, Lai, and Hau (2014) stated that “participants who think that knowledge can be known by authorities produce less counter-arguments, produce less detailed and weaker arguments”. Thus, it can be that students cannot carry out argumentation activities in a qualified way.

The Effect of Argumentation on Students’ 21st Century Skills

The result showed that no significant difference was found between the 21st century skills pre-test scores of the experimental and control group students. This result indicates that students have similar characteristics in terms of 21st century skills before the implementation. After the implementation, there was no statistically significant difference between the 21st century skills post-test scores of the experimental and control group students. The reason for the present research result is that the current program can be said to have a significant effect on improving students’ 21st century skills. The current science program includes some 21st century skills such as creative thinking, critical thinking, entrepreneurship (MoNE, 2018). The other reason for this result may be that an implementation of four weeks is not sufficient for developing 21st century skills. Teachers stated that the classroom environment is not sufficient for the development of 21st century skills, and that there should be laboratory activities or workshops to gain these skills (Çolak, 2018). The absence of a laboratory in the school where the implementation was made may have negatively affected the development of students’ 21st century skills.

Teachers stated that the weekly course hour of the science course is not sufficient for the development of 21st century skills (Çolak, 2018). The fact that the mean of the 21st century skills dimensions are above three, out of five, the teaching method could not develop students’ 21st century skills in a short time. The fact that the students are at the almost sophisticated level in terms of 21st century skills is similar to the findings of Karakaş’s (2015) study. Erol and Taş (2012) stated that the reason why students’ 21st century skills are sophisticated may be due to the fact that activities aimed at problem solving, scientific research, creative thinking, entrepreneurship, communication, using information and technologies, and developing critical thinking skills are included in all courses. In addition to all these, the crowded classrooms in which the teaching method was applied may have negatively affected the development of 21st century skills. Çolak (2018) stated that class size is an important criterion for the development of 21st century skills, and class size plays an important role in the preparation and implementation of the activities according to the individual differences of the student. Clark et al. (2009) stated that students’ participation in scientific discussions in online environments can support the development of 21st century skills. The use of online environments in crowded classrooms can be effective in effectively applying the argumentation.

REFERENCES

Acar O., Turkmen L. & Roychoudhury A. (2010). Student difficulties in socio-scientific argumentation and decision-making research findings: crossing the borders of two research lines. *International Journal of Science Education*, 32(9), 1191-1206. DOI: 10.1080/09500690902991805

scale: adaptation to Turkish culture, validity and examination of factor structure]. *Turkish Science Education*, 7(4), 67-89.


Clark, D., Sampson, V., Stegmann, K., Marttunen, M., Kollar, I., Janssen, J., Weinberger, A., Menekse, M., Erkens, G., & Laurinen, L. (2009). Scaffolding scientific argumentation between multiple students in online learning environments to support the development of 21st century skills. In the national academies’ board on science education workshop on exploring the intersection of science education and 21st century skills, the national institutes of health office of science education (pp. 1-44).


American Families’ Attitudes to Unschooling: A National Survey

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Education Reimagined

Fredrika Reisman
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Holly Anselm
Hemispheres Insights

Abstract

A national survey of American families was conducted to ascertain the extent of interest in self-directed education (SDE) in the United States. Our research took place in the midst of the Covid-19 pandemic - a moment when we required a much better understanding of what parents need from the US education system. Data were gathered using an online survey aimed at parents or caregivers of young people aged 4-18. A total of 1009 adults completed the caregiver survey. Resulting data were analyzed using SPSS. Results suggest a high degree of openness to SDE. The data also elucidate several questions and concerns that parents and caregivers have about the approach. Data also highlighted differing perceptions of and attitudes towards SDE as a function of race. As the first nationwide survey about SDE, this study has made an important contribution to the existing literature on the subject. Directions for further research are discussed

Keywords: Self-Directed Education, SDE, Unschooling, Education Alternatives, Homeschooling, Student-Centered Education

DOI: 10.29329/ijpe.2022.467.12

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INTRODUCTION

Over literature review discusses the current state of the research surrounding unschooling in the United States. In line with the scholarly consensus, researchers consider unschooling and homeschooling to be related to one another. As such, this review begins by discussing the historical development and increasing prevalence of homeschooling in the United States. It shows that there has been a sustained increase in this approach. Unschooling, likewise, appears to be increasingly prevalent, although the extent to which is unknown. Following our discussion of prevalence, we then explore the factors motivating interest in these approaches as well as their educational and social outcomes. We conclude our review by showing that homeschooled youth generally fare quite well in terms of educational attainment and personal development, although outcomes are more mixed for unschooling.

Homeschooling Prevalence

Starting in the late 18th century, with the establishment of public education, families in the United States educated their children at home. However, from the 1970s onwards, there was a marked increase in the uptake of homeschooling as an alternative to the standard education offered in public schools (Efford & Becker, 2017; Kirschner, 2008). Homeschooling, simply put, refers to the practice of educating a child in the home as opposed to a conventional classroom setting in public or private schools (Riley, 2018).

Some estimates put the percentage of homeschooled students in the USA at 3% of the school-age population. Studies outside the USA indicate a growth in interest both in alternative education, more generally, and homeschooling, specifically (English, 2015; Rudge, 2021). While there has been a clear increase in the rates of homeschooling, its prevalence has been hard to determine, with specificity. This is due to the nature of homeschooling and different state regulations governing its use. Despite this, there is a clear consensus that the numbers choosing to homeschool continue to grow (Gaither, 2017).

Although parents choose to homeschool their children for a wide variety of reasons, the most commonly cited is to provide religious or moral instruction in line with a parent or caregiver’s own values and philosophy (Planty et al, 2009). Conservative Christians have long been proponents of homeschooling, and a growing number of adherents to faiths are choosing to educate their children at home (Kunzman, 2010). Parents are also motivated to homeschool due to their own negative experiences in mainstream school, or dissatisfaction with their children’s educational experiences, subject matter or school value. (Green-Hennessy & Mariotti, 2021; Neuman, 2018). Dissatisfaction with dominant cultural influences on public schooling is a key factor in the decision to homeschool for parents of various religious or political convictions (Hansen, 2021).

Homeschooling Outcomes

Given the relatively established status of homeschooling as an educational setting (particularly in the United States), there is a reasonably large and growing body of literature investigating educational outcomes for those who were educated at home. In a large study of over 20,000 children, Rudner (1999) found that homeschooled children outperformed their counterparts in mainstream education across all areas of the curriculum surveyed. These findings were later replicated by further research (Martin-Chang et al, 2011). In a more comprehensive review of available evidence, Murphy (2014) suggests that homeschooled young people enjoy high levels of life satisfaction and tend to view their educational experience more positively than traditionally educated peers. Similarly, Coogan (2010) found that homeschooled youth are likely to score as well - if not better than - their public school counterparts on college entrance exams. They are also perceived to be well prepared for the demands of higher education (Cogan, 2010).
Homeschooling Compared to Unschooling

Both motivation for and approaches to homeschooling vary but they seek to liberate children’s educational experiences from traditional and constrained approaches. For example, homeschooling can take on highly structured methods. Alternatively, it can avoid rigid structure and prescribed curricula. The latter is known as unschooling and is considered to be a variation of homeschooling (Kunzman & Gaither 2020; Valiente et al., 2022). John Holt is credited with coining the term “unschooling” and is considered “the father of unschooling” (Riley, 2020). Holt (2005) believed that true, enduring, useful learning arises solely out of the learners’ experiences, interests and preoccupations. He believed that all children have an innate, infinite drive to make sense of the world around them. Unschooling has its roots in this philosophy. This view of education aligns with more recent views of the purpose of education. For instance, Hansen describes a “holistic-indigenous” program that is “human-centered” and “liberatory” as contrasting with the more traditional “Cartesian-Newtonian” worldview embedded in traditional educational methods (Hansen, 2021, p. 68).

There are many names used to describe unschooling and there is a large and growing number of adherents to this approach to education. This heterogeneity creates a diverse constellation of practices that is united by the primacy of self-directed learning. (Sherman, 2017). More specifically, in unschooling, parents do not rely on a set materials or a curriculum. Rather, children learn through experience in daily life (Riley, 2018).

Unschooling promotes freedom of choice and the opportunity to set one’s own educational direction. This looser structure means children’s educational goals more closely match their unique interests, skills and learning styles. (Taylor-Hough, 2010; Wheatley, 2009). In keeping with this understanding of unschooling, the Mosaic team crafted a particular definition of the term. Our research defined unschooling as a “process where young people direct their own learning, at their own pace, without the rigid structures of formal education. Instead of following curricula (e.g. in homeschooling), young people are given a supportive setting that fosters their natural curiosity of the world.”

Unschooling Prevalence

There are few reliable estimates of the prevalence of unschooling in the United States. Riley (2018) suggests that 12% of all homeschooled young people may be unschooled. Vangelova (2014) suggests that the number may be as high as 1 million. There is a growing number of publications detailing how to successfully unschool children (e.g. Dodd, 2009 and Griffith, 2010). There is also a growing body of web-based resources available to both current and potential unschooling families. The increase of such materials suggests there is a growing popular appetite for unschooling. There is, however, a lack of reliable estimates of the prevalence of unschooling and no data exist on perceptions and attitudes towards this approach among the general public.

In response to these lack of data, the present study sought to ascertain popular perceptions of and attitudes toward unschooling. One key goal of the research was to determine the level of interest in unschooling. Following on from this, the research sought to elucidate what questions or concerns American families had about unschooling. In doing so, this nationally representative study makes an important contribution to the literature on this subject.

The existing literature around unschooling has mostly focused on the beliefs and values of families who are pursuing an unschooling approach (Gaudreau & Brabant, 2021). Many families seek out unschooling as an alternative to the rigid structures of conventional education (DeWitt et al., 2017; Riley, 2020). Some move to unschooling after a period of more structured homeschooling (Riley, 2020), while others see it as a countercultural endeavor for both parents and children (Kirschner, 2008). In contrast, some unschoolers see the approach not only as an educational philosophy, but an alternative lifestyle whereby parents avoid a coercive role in any domain of education or childrearing (Petrovic & Rolstad, 2017). Some proponents of unschooling view it through a social justice lens.
(Petrovic & Rolstad, 2017; Romero, 2021; Romero & Yellowhorse, 2021). For example, Romero (2018) sees self-directed education and autonomous learning as tools with which students and teachers can break free from negative environments, and in the process, move toward a more liberated, socially-just future. To do so, they must recast the relationship between teacher and student as collaborative, acknowledging that teachers learn from students just as students learn from teachers.

**Unschooling Outcomes**

Despite homeschooling’s promise of acknowledging student interests, self-efficacy (an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments), and self-concept. (an idea of the self constructed from the beliefs one holds about oneself and the responses of others), empirical research has not yet demonstrated its social justice impact. In a survey of unschooling families, Morrison (2018) found that the potential of unschooling approaches to provide a multicultural, social justice focused education is not happening for many families. Furthermore, Wilson (2015) found that even in a Sudbury school – characterized by democratic governance devoid of hierarchies, privileged voices dominate in the school as is often the case in society. Thus, it seems that, despite its potential, the transformative vision of unschooling does not necessarily lead to a radical rethinking of the educational status quo to provide more equitable learning experiences.

While the research is limited, unschoolers themselves attribute a range of powerful benefits to the approach. For example, they view it as a modality ideally suited to foster intrinsic motivation (Riley, 2018). Levin-Gutierrez (2015), posits that unschooled learning environments - unlike mainstream traditional environments - foster autonomy, mastery, and purpose; the three elements essential for intrinsic motivation, as theorized by Pink (2009). Likewise, Sherman (2015) contends that the central role of autonomy in unschooling plays a significant role in motivation and it, ultimately, can build self-efficacy, self-regulation and intrinsic motivation among youth. Moreover, proponents argue that unschooling promotes lifelong learning (Sanchez Tyson, 2019). This theoretical assertion is substantiated by the findings of Gray and Riley (2015) who found that unschoolers believed their unschooling led to them to become lifelong learners.

There are a number of reviews of the existing literature on homeschooling. Kunzman & Gaither (2013) conducted a comprehensive review of the literature on homeschooling that they later updated (Kunzman & Gaither, 2020). Their 2020 update revealed a marked increase in scholarly interest in the subject. Gray and Riley (2013) conducted a study of 232 unschooling parents to ascertain the perceived benefits and challenges. Their analysis revealed that the primary challenge experienced by unschooling families was dealing with external criticism and social pressure from those who disapproved of these families’ choices. On the other hand, parents reported a range of positive outcomes for both their children and family, including improved learning, better attitudes to learning, improved psychological and social wellbeing among children and increased closeness and harmony at home.

In later follow-up studies, researchers Gray and Riley (2015a, 2015b) explored adult unschoolers’ perceptions of their schooling and their subsequent experiences in higher education and employment. In one study, they found that unschoolers had an overwhelmingly positive view of their educational experience. Perceived benefits included the freedom to study topics of interest on their own terms, the ability to self-motivate and self-direct, as well as a sense of personal responsibility and appreciation for lifelong learning. In contrast, only a small number attributed a perceived learning deficit to their education but most of these were able to compensate for this when required. Only three of the sample of 75 reported that the disadvantages of unschooling outweighed the advantages. They named learning deficits as a major disadvantage as well as social isolation and stigmatization.

In the second study, Riley and Gray (2015) surveyed 75 unschooled adults about their experiences in higher education and employment. The results revealed that more than 4 in 5 progressed to formal higher education and nearly half had completed or were in the process of
completing a bachelor’s degree program. Findings indicated that those who had spent more time in an unschooling environment were more likely to study at university. Furthermore, those surveyed experienced few significant problems either accessing further education or adapting to the demands of this different environment and approach once attending. The majority of participants believed their unschooling prepared them for both further study and the world of work, by enhancing their sense of personal responsibility, intrinsic motivation and a love of learning.

In a small study utilizing a phenomenological approach, Gaudreau and Brabant (2021) found some evidence supporting previous findings that unschooled children develop keen interests and successfully self-direct their own learning. Findings also revealed that participation in unschooling influenced views on society, employment, and the education system, more broadly, and on the role of the state in the education, more specifically. Their results, however, reveal perceived shortcomings in learning perseverance, pursuit of complex learning goals, school integration and evaluation. Participants believed that some subjects, such as math, physics and engineering, were too complex for learners to study on their own and that children are unlikely to persevere with difficult subjects without encouragement.

Other studies, too, have found mixed outcomes for unschooled young people. Martin-Chang et al (2011) compared homeschooled children to demographically paired children educated in mainstream schools. This study found that those who were homeschooled in a structured environment (defined as an environment in which lesson plans were used) performed better than their public school counterparts. Those who follow an unstructured approach (rarely to never using lesson plans), however, performed worse than their public school educated counterparts.

Summary

Our review outlined the origins and key characteristics of unschooling and we find that unschooling is widely considered a variation of homeschooling, although it is radically child-centered and has autonomy and intrinsic motivation at its core. Despite the high levels of agreement regarding these elements, our review found that unschooling remains a contested framework lacking a clear definition.

The literature on the prevalence of unschooling was outlined and it was determined that, although it appears interest in unschooling is increasing, there is a dearth of reliable figures about its prevalence. In addition, the potential benefits of this approach - as posited by its proponents and practitioners - were outlined in our review. Thereafter, the findings of the existing literature surrounding educational and social outcomes were discussed. We conclude that the current literature suggests a mixed impact for this approach.

METHODS

Design

To complete this study, a survey was disseminated by a family philanthropy to better understand the demand for self-directed education. The survey was designed and completed by a market-research company. The overall research strategy was to conduct a public opinion survey to determine interest in self-directed education (SDE) in a US sample. This research sought to determine interest in and perceptions of SDE as well as attitudes to education more generally. The research utilized a survey instrument targeted at parents and caregivers of young people aged 4-18. Quantitative data were generated based on survey responses.

Materials

A market research company conducted a web-based survey between July and August 2021 using an instrument targeting parents and caregivers of children aged 4-18. Development of the survey
instrument was informed by a series of focus groups that asked parents and caregivers for their views on educational alternatives. The focus groups assessed awareness of and attitudes towards learning approaches and openness to SDE as well as testing descriptions of SDE. Four focus groups were held on Zoom, and each was two hours in length. Each group comprised 5-6 participants. The first focus group included parents whose children, aged 4-16, were in education alternatives. The second group included students aged 13-18 who were currently in education alternatives. The two remaining groups comprised parents who were considering an education alternative for their children. The first three focus groups were comprised of participants of various ages, genders, ethnicities, and household incomes, while the last focus group was composed of families defined as historically marginalized. To be considered historically marginalized, participants had to meet any two of the following three criteria: 1) live in a household with a person of color, 2) the highest level of education attainment is high school diploma or less and 3) have an annual household income of $50k or less. In total, 22 individuals participated in the focus groups.

The resultant survey comprised eight sections and 44 items. Participants were first presented screening and demographic questions concerning age, gender, household characteristics. Thereafter, they were asked about their interest in SDE and reasons for considering or not considering it. Thereafter, questions explored educational goals and attitudes, generally, as well as towards SDE, specifically. Participants were then presented with descriptions of SDE and asked to indicate what they liked, disliked, had questions about, and how these messages impacted their views of SDE.

Participants

Participants were recruited using an online market survey platform from July 21 to August 2, 2021. To be included in either survey, participants had to express some openness to SDE. Openness to SDE was first gauged by the question “Excluding money, transportation, and scheduling concerns, how interested are you in having your child in an education alternative where your child leads the decisions to determine what, when, or how they learn; a learning pathway where they follow their unique interests?” Participants were then asked “What are the reasons you might consider pursuing an education alternative for your children?” Those who failed to list at least one reason they might consider an education alternative for their child(ren) and selected “I would not consider an educational alternative for my child” (n=75) were excluded from the survey sample.

To be included in the survey, participants had to have at least one child aged 4-18 at home for whom they were primarily or jointly responsible. Participants were screened to ensure that they met these criteria. From the family interest survey, a total of 1406 participants were excluded for not having one or more children aged 4-18 at home, 168 were excluded for having no children aged 4-18 at home, 31 were excluded for having no input into their children’s education, and 75 were excluded for demonstrating no openness to an educational alternative.

The sample was selected to be reflective of the US population by gender and age. A total of 1009 participants completed the survey. 260 of those were definitely likely to educate their children in an unschooling/SDE setting, and 200 met the criteria to be designated as historically marginalized. To be considered historically marginalized, participants had to meet any two of the following three criteria: 1) live in a household with a person of color, 2) the highest level of education attainment is high school diploma or less and 3) have an annual household income of $50k or less.

Procedure

Participants were invited to complete the survey on an online survey platform. Those who expressed an interest were asked to indicate consent and then asked to complete the survey.
RESULTS

Background and Interest in SDE

Survey participants represent a variety of demographic and racial backgrounds. In particular, this nationally representative sample (n=1009) primarily comprised parents who were married, in their 30’s and 40’s, with 1 or 2 children. BIPOC families were well represented. Details can be found in Table 1.

Table 1. Race of Survey Respondents

(Participants were able to select multiple identities.)

<table>
<thead>
<tr>
<th>Race</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>80%</td>
</tr>
<tr>
<td>African American</td>
<td>9%</td>
</tr>
<tr>
<td>Latinx</td>
<td>9%</td>
</tr>
<tr>
<td>Indigenous</td>
<td>2%</td>
</tr>
<tr>
<td>Multiracial</td>
<td>24%</td>
</tr>
<tr>
<td>East Asian</td>
<td>5%</td>
</tr>
</tbody>
</table>

Overall, 74% of survey participants signaled interest in SDE. Specifically, they were asked: “Excluding money, transportation, and scheduling concerns, how interested are you in having your child in an education alternative where your child leads the decisions to determine what, when, or how they learn; a learning pathway where they follow their unique interests?” Because this is a nationally representative sample, the findings are notable. Our results suggest that potentially millions of families in the US are interested in SDE.

In order to better understand the families that were interested in SDE, we examined additional demographic characteristics. While these results show that those interested in SDE are largely white, college-educated and have economic privilege, it is important to note that SDE holds interest to families across a variety of backgrounds. Tables 2 and 3 present these additional details.

Table 2. Education of Family Survey Respondents

<table>
<thead>
<tr>
<th>Education Level</th>
<th>% Family Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Graduate</td>
<td>58%</td>
</tr>
<tr>
<td>Assoc/Technical Degree</td>
<td>14%</td>
</tr>
<tr>
<td>Some College</td>
<td>16%</td>
</tr>
<tr>
<td>HS or Less</td>
<td>12%</td>
</tr>
</tbody>
</table>

Table 3. Income of Family Survey Respondents

<table>
<thead>
<tr>
<th>Income Level</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;$75K</td>
<td>57%</td>
</tr>
<tr>
<td>$50-$75K</td>
<td>19%</td>
</tr>
<tr>
<td>$25-49K</td>
<td>16%</td>
</tr>
<tr>
<td>&lt;$25K</td>
<td>8%</td>
</tr>
</tbody>
</table>

Family Goals for SDE

Our analysis led to three key findings. First, families want their children to gain social and employment skills from their educational experience. Second, they want their children to be actively engaged in their learning. And, third, they want their children to have a flexible educational experience.
In general, our analyses of the survey data indicate that families want their children’s educational experience to lead to productive participation in society and secure employment. These goals are more important than those pertaining to daily-life skills and lifelong learning. Just as significant, caregivers place very low importance on meeting grade level expectations and achievement on standardized tests. Details of this finding can be found in Table 4. The Table presents the percentage of respondents who chose a given goal as their top priority for their children’s education.

Table 4. Educational Goals of Survey Respondents

<table>
<thead>
<tr>
<th>Most important educational goal</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have the social skills to successfully participate in society</td>
<td>30%</td>
</tr>
<tr>
<td>Financially support themselves</td>
<td>29%</td>
</tr>
<tr>
<td>Employment doing something they enjoy/love doing</td>
<td>27%</td>
</tr>
<tr>
<td>Attend college or technical school</td>
<td>25%</td>
</tr>
<tr>
<td>Graduate from a high school</td>
<td>24%</td>
</tr>
<tr>
<td>Get a good job</td>
<td>24%</td>
</tr>
<tr>
<td>Have daily-life skills</td>
<td>24%</td>
</tr>
<tr>
<td>Be a lifelong learner</td>
<td>22%</td>
</tr>
<tr>
<td>Have the children study topics they are interested in</td>
<td>19%</td>
</tr>
<tr>
<td>Have the emotional skills to understand themselves and successfully form lasting relationships</td>
<td>19%</td>
</tr>
<tr>
<td>Meet or exceed grade level academic standards</td>
<td>17%</td>
</tr>
<tr>
<td>Meet or exceed grade level expectations on standardized tests</td>
<td>12%</td>
</tr>
<tr>
<td>Other</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

In addition, our research shows that families want their students to be actively – not passively – engaged in their own learning. Support for this finding can be found in additional survey results. In particular, participants were asked “What do you see as the current or potential benefits of Unschooling/Self-Directed Education for your children?” along with 13 choices as well as a write-in option. The top response, with 36% of survey takers selecting it was “Children learn academics while pursuing their interests.” This response was tied with children having the opportunity to learn social, emotional and life skills. At the same time, families also want their children to play a part in driving their education. In particular, when asked about their goals for SDE, the survey indicates that 34% of families are interested in it because they want to be sure that their “children are engaged and take the lead in their own education.”

Table 5. Current or Potential Benefits of SDE

<table>
<thead>
<tr>
<th>Current or Potential Benefits of SDE</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children learn academics while pursuing their interests</td>
<td>36%</td>
</tr>
<tr>
<td>Children have the opportunity to learn social/emotional/life skills</td>
<td>36%</td>
</tr>
<tr>
<td>Children are engaged and take the lead in their own education</td>
<td>34%</td>
</tr>
<tr>
<td>Support for children’s individual needs</td>
<td>34%</td>
</tr>
<tr>
<td>Program flexibility</td>
<td>33%</td>
</tr>
<tr>
<td>Expose children to alternative perspectives/expectations</td>
<td>31%</td>
</tr>
<tr>
<td>Flexibility to engage with other students and/or adults</td>
<td>28%</td>
</tr>
<tr>
<td>Support for children from knowledgeable, caring adults</td>
<td>24%</td>
</tr>
<tr>
<td>Connection with like-minded families</td>
<td>23%</td>
</tr>
<tr>
<td>Support from families on a similar path</td>
<td>21%</td>
</tr>
<tr>
<td>Get away from mistreatment</td>
<td>19%</td>
</tr>
<tr>
<td>Support for my family’s cultural values</td>
<td>19%</td>
</tr>
<tr>
<td>Support for my family’s racial identity</td>
<td>14%</td>
</tr>
<tr>
<td>Other</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

The third key finding focuses on children having a flexible educational experience. While the survey results clearly indicate that families want children to learn necessary life skills, the research also indicates that it is essential that SDE be authentically self-directed and not simply “window dressing” on pre-assigned topics and issues. Families report that they want their students to have real choice in their learning. For instance, survey takers were asked “What do you see as the current or potential benefits of Unschooling/Self-Directed Education for your children?” Participants had 13
choices as well as a write-in option. The top response was “to learn necessary life skills.” However, the second choice was allowing children to focus on topics that matter to them (41%). These results and others are found in Table 5. Several high ranking responses focus on an educational experience that is closely tailored to individual student needs.

**Barriers and Opportunities**

Families identified barriers that can stand in the way of uptake of SDE. These barriers, in some sense, are a response to current experiences—families want to be sure these experiences are not replicated in SDE. Thus, while these findings point to potential barriers to accessing SDE, they also clearly suggest opportunities for strengthening the appeal of SDE to a large variety of families. More specifically, we identified two key findings from our assessment of barriers: (1) SDE must provide individualized attention to students; and, (2) SDE must offer clear guidance to students who engage with it. Details of these findings are presented in the following sections.

Survey results first suggest that SDE can meet a young person’s needs by ensuring that its learning platforms and approaches are actually intended to be about a young person’s individualized experience. Survey takers were asked: “What are the reasons you might consider pursuing an education alternative for your children?” and provided a list of 12 choices including a write-in option. The third highest response (listed in Table 6) was “support for my children’s individual needs (e.g., learning differences, advanced learning)” with 40% of families selecting this choice. Top reasons were learning necessary life skills and focusing on topics that matter.

**Table 6. Reasons Parents might Choose SDE**

<table>
<thead>
<tr>
<th>Reason</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>To learn necessary life skills</td>
<td>42%</td>
</tr>
<tr>
<td>Allows my children to focus on topics that matter to them</td>
<td>41%</td>
</tr>
<tr>
<td>Support for my children’s individual needs</td>
<td>40%</td>
</tr>
<tr>
<td>Focus on academic skills I think are important</td>
<td>37%</td>
</tr>
<tr>
<td>Provide an environment more conducive to learning</td>
<td>35%</td>
</tr>
<tr>
<td>To learn social/emotional skills</td>
<td>33%</td>
</tr>
<tr>
<td>Expose my children to alternative perspectives/expectations</td>
<td>30%</td>
</tr>
<tr>
<td>Provide a supportive environment for social/emotional learning</td>
<td>29%</td>
</tr>
<tr>
<td>Support for my family’s cultural values</td>
<td>19%</td>
</tr>
<tr>
<td>Get away from mistreatment</td>
<td>19%</td>
</tr>
<tr>
<td>Support for my family’s racial identity</td>
<td>18%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
</tr>
</tbody>
</table>

The second, and perhaps most notable barrier, focuses on clarity in accessing and pursuing SDE. Our research indicates that any SDE efforts must provide a clear and easily understood pathway to learning and success for students. A lack of awareness around what SDE entails emerged as a significant barrier to uptake. Despite values and goals frequently aligning with the opportunities offered by SDE, more complete information is required if families are going to commit to this approach to education. Evidence for this finding can be found in the data. Families were asked the following question: “Excluding money, transportation, and scheduling, what concerns or questions do you have about Unschooling/Self-Directed Education for your children?” and they were provided eight options to choose from along with a write-in option. The top answer was “I need more information,” which was selected by 51% of survey takers.
Table 7. Concerns about SDE

<table>
<thead>
<tr>
<th>Concern about SDE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I need more information</td>
<td>51%</td>
</tr>
<tr>
<td>Checks and balances are needed to ensure a good outcome</td>
<td>31%</td>
</tr>
<tr>
<td>This alternative won’t prepare my children for their future</td>
<td>27%</td>
</tr>
<tr>
<td>My children will miss out on important childhood experiences</td>
<td>26%</td>
</tr>
<tr>
<td>Children are not equipped to determine what they need to learn</td>
<td>25%</td>
</tr>
<tr>
<td>This alternative doesn’t seem like a good fit for my children</td>
<td>23%</td>
</tr>
<tr>
<td>There is not enough social interaction for my children, with peers and/or adults</td>
<td>19%</td>
</tr>
<tr>
<td>I’m uncomfortable with other/unknown adults educating my children</td>
<td>14%</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
</tr>
</tbody>
</table>

Differences by Race

Because of long-standing challenges to equity across racial identity in the American public education system, we paid particular attention to differences in attitudes toward SDE across different racial groups among survey takers. We found that there are notable differences among racial communities and their overall enthusiasm for, and attitudes toward, SDE. In general, white, Latinx, and multi-racial families are more apt to favor it. On the other hand, African American and East Asian families have a dimmer view of it. In fact, African American families are the least likely group to pursue SDE or unschooling. Table 8. presents the percentage of families within each group that are either “likely” or “unlikely” to pursue SDE.

Table 8. Position Toward SDE Among All Respondents (High ratings noted in blue.)

<table>
<thead>
<tr>
<th>Position Toward SDE</th>
<th>White (n=800)</th>
<th>African American (n=90)</th>
<th>Latinx (n=87)</th>
<th>East Asian (n=34)</th>
<th>Multi/Biracial (n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely to pursue it</td>
<td>48%</td>
<td>30%</td>
<td>39%</td>
<td>35%</td>
<td>45%</td>
</tr>
<tr>
<td>Unlikely to pursue it</td>
<td>27%</td>
<td>34%</td>
<td>33%</td>
<td>44%</td>
<td>30%</td>
</tr>
<tr>
<td>Need more information</td>
<td>14%</td>
<td>11%</td>
<td>11%</td>
<td>24%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Table 9. identifies the reasons families would choose SDE for their children. Across all families, SDE is desired because it is viewed as “good” for children. Although this opinion was the most commonly cited reason for pursuing this approach, it is worth noting that white families are significantly more likely to hold this view of SDE.

Table 9. Reasons for Pursuing SDE

<table>
<thead>
<tr>
<th>Reason</th>
<th>White (n=800)</th>
<th>African American (n=90)</th>
<th>Latinx (n=87)</th>
<th>East Asian (n=34)</th>
<th>Multi/Biracial (n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is good, children like it, it’s interesting</td>
<td>30%</td>
<td>17%</td>
<td>20%</td>
<td>18%</td>
<td>25%</td>
</tr>
<tr>
<td>Educationally sound</td>
<td>7%</td>
<td>3%</td>
<td>8%</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Can learn at their own pace / individualized</td>
<td>7%</td>
<td>6%</td>
<td>7%</td>
<td>3%</td>
<td>13%</td>
</tr>
<tr>
<td>Good fit for my child</td>
<td>7%</td>
<td>4%</td>
<td>7%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Life skills focused and prepares for adulthood</td>
<td>3%</td>
<td>3%</td>
<td>2%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Builds confidence, social and emotional skills</td>
<td>3%</td>
<td>1%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Current system is not working well</td>
<td>3%</td>
<td>1%</td>
<td>3%</td>
<td>3%</td>
<td>8%</td>
</tr>
</tbody>
</table>

When asked why they would not pursue SDE, there is more variation among the different communities surveyed. For both White and African American families, the primary reason is that SDE is “academically unsound.” Latinx families, however, are more likely to feel “uncomfortable” about the approach. East Asian families do not feel that it is a “good fit” for their children, while multi-racial families are more likely to see the approach as “too unstructured.” Additional details can be found in Table 10.
Table 10. Reasons for Not Pursuing SDE (High ratings noted in blue.)

<table>
<thead>
<tr>
<th>Reason</th>
<th>White (n=800)</th>
<th>African American (n=90)</th>
<th>Latinx (n=87)</th>
<th>East Asian (n=34)</th>
<th>Multi/Biracial (n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academically unsound / need core classes</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Too unstructured</td>
<td>8%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>14%</td>
</tr>
<tr>
<td>Not a good fit</td>
<td>7%</td>
<td>8%</td>
<td>5%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>Uncomfortable with it</td>
<td>5%</td>
<td>6%</td>
<td>14%</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Prefer traditional education</td>
<td>5%</td>
<td>6%</td>
<td>3%</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Too much work / time</td>
<td>1%</td>
<td>1%</td>
<td>6%</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Need to learn social skills</td>
<td>1%</td>
<td>1%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

There are clear trends in Table 10. with the one exception that SDE is viewed as “academically unsound.” This was the most frequent response among white and African American families and the second most frequent among the other groups. Furthermore, when families were asked what their children’s current educational setting needed to do differently in order to better meet their goals, all groups named increased focus on academics as their number one area to improve. This finding suggests that any communications effort on behalf of SDE may want to make the case that this approach is academically robust and provides students with needed academic preparation.

Table 11 below provides one additional insight into families’ views about SDE. When asked what questions they had about SDE, the primary response – across all groups – was the need for more information. In general, it appears that families need details and specifics about SDE in order to take on this approach to education. East Asian families were significantly more likely to require information about results and success rates. These families were also significantly more likely than other groups to express specific concerns about future validity of qualifications. Very few significant differences emerged between groups regarding concerns about SDE, indicating that American families shared broadly similar concerns irrespective of racial background.

Table 11. Questions or Concerns about SDE

<table>
<thead>
<tr>
<th>Question or Issue</th>
<th>White (n=800)</th>
<th>African American (n=90)</th>
<th>Latinx (n=87)</th>
<th>East Asian (n=34)</th>
<th>Multi/Biracial (n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I need more information</td>
<td>53%</td>
<td>38%</td>
<td>45%</td>
<td>47%</td>
<td>57%</td>
</tr>
<tr>
<td>Checks and balances are needed</td>
<td>32%</td>
<td>32%</td>
<td>24%</td>
<td>26%</td>
<td>32%</td>
</tr>
<tr>
<td>Won’t prepare my child for their future</td>
<td>28%</td>
<td>19%</td>
<td>23%</td>
<td>26%</td>
<td>25%</td>
</tr>
<tr>
<td>Child will miss out on important experiences</td>
<td>26%</td>
<td>24%</td>
<td>25%</td>
<td>24%</td>
<td>26%</td>
</tr>
<tr>
<td>Child is not equipped to determine their need</td>
<td>25%</td>
<td>28%</td>
<td>29%</td>
<td>26%</td>
<td>29%</td>
</tr>
<tr>
<td>Not a good fit for my children</td>
<td>23%</td>
<td>23%</td>
<td>22%</td>
<td>26%</td>
<td>28%</td>
</tr>
<tr>
<td>There is not enough social interaction</td>
<td>19%</td>
<td>20%</td>
<td>28%</td>
<td>15%</td>
<td>24%</td>
</tr>
<tr>
<td>I’m uncomfortable with other/unknown adults</td>
<td>14%</td>
<td>17%</td>
<td>14%</td>
<td>9%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Reasons Families Pursue SDE

Data analysis revealed five primary reasons families of all races would pursue SDE. Table 12 presents these reasons. Interestingly, there is some variation among different communities and their views of these reasons. White and African American families are significantly more likely than Hispanic families to cite support for cultural values and racial identity as a reason to pursue SDE. White and East Asian families are the most likely groups to see SDE as a way to avoid mistreatment. White and Multiracial households are more likely to expressly prioritize social and emotional skills whereas African American, Latinx, and East Asian respondents are more likely to focus on academic content. White, Multiracial and East Asian families are more likely to see a focus on individual needs and topics tailored to their children’s interests as a benefit of SDE.
Table 12. Reasons for Pursuing SDE

<table>
<thead>
<tr>
<th>Goal</th>
<th>White (n=500)</th>
<th>African American (n=90)</th>
<th>Latinx (n=87)</th>
<th>East Asian (n=34)</th>
<th>Multi/Biracial (n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learn necessary life skills</td>
<td>41%</td>
<td>47%</td>
<td>38%</td>
<td>41%</td>
<td>39%</td>
</tr>
<tr>
<td>Focus on topics that matter to them</td>
<td>43%</td>
<td>33%</td>
<td>33%</td>
<td>47%</td>
<td>47%</td>
</tr>
<tr>
<td>Support my child’s individual needs</td>
<td>41%</td>
<td>31%</td>
<td>37%</td>
<td>44%</td>
<td>50%</td>
</tr>
<tr>
<td>Focus on important academic</td>
<td>36%</td>
<td>41%</td>
<td>39%</td>
<td>50%</td>
<td>36%</td>
</tr>
<tr>
<td>Provide a learning environment</td>
<td>35%</td>
<td>30%</td>
<td>40%</td>
<td>32%</td>
<td>43%</td>
</tr>
<tr>
<td>To learn social/emotional skills</td>
<td>35%</td>
<td>32%</td>
<td>30%</td>
<td>29%</td>
<td>39%</td>
</tr>
<tr>
<td>Exposure to alternative perspectives</td>
<td>30%</td>
<td>27%</td>
<td>32%</td>
<td>44%</td>
<td>35%</td>
</tr>
<tr>
<td>Provide a supportive environment</td>
<td>31%</td>
<td>23%</td>
<td>24%</td>
<td>24%</td>
<td>34%</td>
</tr>
<tr>
<td>Support my family’s cultural values</td>
<td>19%</td>
<td>20%</td>
<td>9%</td>
<td>21%</td>
<td>25%</td>
</tr>
<tr>
<td>Be in a community of like-minded families</td>
<td>19%</td>
<td>12%</td>
<td>22%</td>
<td>12%</td>
<td>23%</td>
</tr>
<tr>
<td>Get away from mistreatment</td>
<td>19%</td>
<td>12%</td>
<td>14%</td>
<td>18%</td>
<td>23%</td>
</tr>
<tr>
<td>Support for my family’s racial identity</td>
<td>13%</td>
<td>17%</td>
<td>7%</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>I would not consider an educational alternative for my children</td>
<td>4%</td>
<td>3%</td>
<td>3%</td>
<td>-</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>-</td>
<td>2%</td>
</tr>
</tbody>
</table>

DISCUSSION

Our research took place in the midst of the Covid-19 pandemic - a moment when we needed a much better understanding of what parents need from the US education system. It provides a glimpse into parents’ views not only of student driven education, but also their hopes for their children’s educational experience, in general. This, in and of itself, is notable because parents’ have frequently struggled to be fully represented within the public education system (Curry & Holter, 2019; Gonzalez-DeHass & Willems, 2003). This is particularly true of BIPOC parents (Crosier, 2001; Olivos, 2004; William & Sanchez, 2012). Perhaps most importantly, we know that parental involvement is essential for children’s academic performance and success (Jafarov, 2015). Our study provides detailed information about what parents want from their children’s education. With this knowledge it is easier to build bridges toward them and work toward fuller parental engagement in the educational experience.

While our results frequently focus specifically on SDE, it is important to note that the findings have broad application - to traditional public education, private schooling, out-of-school time, homeschooling and student-driven education. Our research shows that parents hold a number of hopes - and concerns - for their children and their educational trajectory. In particular, when we asked families what they want from their children’s educational experience (regardless of whether it is SDE or not) they stated their educational goals were: (1) ensuring their children have the social skills to successfully participate in society and (2) having their children financially support themselves (Table 4). By emphasizing employability, families continue to reflect long standing views of education as preparing adults for modern, industrial society. From this perspective, educational systems valorize autonomous decision-making (Inglehart & Baker, 2000).

At the same time, parents are calling for something more. Specifically, parents view SDE as a vehicle for providing a richer educational experience. When asked what they want from SDE, they stated they: (1) want their children to learn academics while pursuing their interests and (2) for their children to have an opportunity to learn social/emotional life skills (Table 5). By saying - in nearly equal measures - that they value employment, academics and social/emotional life skills, families are asking for an educational system that can deliver on the promise of full personhood. These findings suggest that parents desire an educational experience that is holistic and integrated.

This more integrated view of the educational experience has been termed the “holistic indigenous world view” (Hansen, 2021). Such a view regards education as attending to the physical, intellectual, social, emotional and spiritual aspects of their being. Crucially, this is a collaborative
project realized through the combined efforts of families, schools, communities, and societies. Such a model stands in sharp contrast to the dominant Cartesian-Newtonian educational paradigm whereby children are regarded as passive receptacles of knowledge and values. The goals of this model are political, social and economic in nature and are not concerned with the unique personhood of the child (Hansen, 2021). SDE, in contrast, has the potential to be liberatory and empowering for families and youth.

SDE, however, is not a panacea. Families clearly explain what worries them about this educational approach and what would need to be delivered by a self-directed system for it to be successful. Specifically, the path to successful engagement in SDE needs to be laid clear. One of the strongest findings to emerge from our study was the need for “more information” as a family concern about SDE. Perhaps this finding is not surprising given what we know about parental engagement in school and existing research about information flow between schools and families. Goodall and Montgomery (2013) have described an information continuum where there is a move from information giving (on the part of schools) to a sharing of information between parents and schools - and as information sharing increases, parental engagement and agency increases. In this light, it feels fair to interpret our findings not solely as a need for SDE to be fully explained to parents, but as a request by parents for full information-based engagement in their children’s educational project.

There has been much popular and journalistic speculation that parents are open to considering educational approaches or philosophies that differ from those offered by mainstream education. The upheaval caused by the COVID-19 pandemic is considered by many to have increased appetite for change. The present study offers clear evidence that American parents are indeed open to educational alternatives more broadly and SDE specifically.

Our research shows that parents are cognizant of both the benefits and drawbacks of such an approach and are looking for more information to help them make informed, thoughtful decisions. Educational alternatives appeal to a broad segment of American society for a variety of reasons, they academic, professional, social, emotional, or liberatory. The data show that parents want a comprehensive, holistic educational experience for their children - one focused on full personhood - and many consider SDE to be a potential path to such an experience. The present study has thus made an important contribution to knowledge about parents’ wishes for their children and perceptions of the education system and different educational approaches.

In terms of future research, the authors recommend that further quantitative studies be conducted to ascertain whether the conclusions above will be replicated. They also recommend that qualitative studies be conducted with parents to complement the striking conclusions above with rich qualitative data. Such studies would allow for a more complete understanding of the research question and determine whether the conclusions found in the present study were fully informed by the Covid-19 pandemic, or are indicative of a deeper and systemic view of the current educational system in the United States.

REFERENCES


An Investigation of Color Preferences of Students with Special Needs

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Abstract

The purpose of this study was to examine the primary and secondary color preferences of students with special needs as well as their color preference for an object regarding their disability types, school levels, and gender. The study employed a survey research design with quantitative methodology. It was conducted with the participation of 549 students with Intellectual Disability, Autism Spectrum Disorder, Down Syndrome and Learning Disability. The researchers collected the data by using a car visual together with the geometric shapes used by Ece and Çelik (2009). The collected data were entered into the Excel program, and the frequency and percentage values were obtained. The results revealed that according to their school level, students’ primary and secondary color preference changed. When the geometric shape was changed, students’ color preferences changed, accordingly. With respect to their disability types, students preferred red as the primary color and blue as the secondary color, and they chose blue for the car visual. It was found that while primary and secondary color preferences of male and female students differed but they preferred blue for the car visual.

Keywords: Colors; Color Preference; Students With Special Needs

DOI: 10.29329/ijpe.2022.467.13
INTRODUCTION

Colors are defined as the forces that exist in the perception limits of individuals and that being lived together at all times, but the effects of which are often not noticed (Koca & Koç, 2008). Colors can be a visual expression of an individual's mental state, emotions and character by affecting all areas of life especially in the produced color form. Based on the culture, age (Adams-Osgood, 1973), gender, development level, the studied topic, and the activity conducted, colors have a direct impact on the moods, emotions, behaviors and performances of individuals (Daggett, 2008). The low or high vibrational energies of colors affect the physical, emotional, and mental reactions of individuals, and yet, the individuals' reactions to colors can differ. While some colors have a stimulating effect on individuals, some others have a calming effect. On the other hand, some colors have a relaxing effect, whereas some others may cause anxiety.

As colors are the perceptions constructed by the brain (Kümmerling-Meibauer, 2019), they are perceived primarily sensorially (Etike, 2001). The reason behind the perception of colors is that each individual sees a color differently because the same color appears differently on a textured or reflective surface. There is a direct connection between the brain and the body, and the reactions related to colors appear independently of thoughts (Daggett, 2008). Bright and intense colors receive a response from the primitive brain called the limbic system. This is a response associated with biological color inheritance. The role of the left brain is to name colors, label them with qualifications (lemon yellow), transforming words or colors into emotional responses, and enumerate the steps in color creation. On the other hand, the role of the right brain is to specialize in the perception of color associations and the discovery of consistency patterns. Because of the fact that a child's brain connections are not completed by the age of five or six, and s/he needs another year to mature, the child employs visual materials to communicate with the environment. Therefore, colors become one of the most effective means of communication for children.

Colors can be defined through the terms used for color temperatures. These color temperatures show that vibrant colors, known as warm colors, exist in the red range, and cool colors, representing silence and relaxation, exist in the blue range (Ballast, 1992). Since warm colors can be noticed and seen quickly in the visual order, they create the feeling of closeness (Uçar, 2004). While red, orange, and yellow, known as warm colors, increase joy, creativity, energy and dynamism, they can cause the feelings such as excitement, tiredness, violence, aggression and the concentration difficulty (Becer, 1999). Cool colors, on the other hand, create a withdrawal effect by generating a feeling of avoidance in individuals (Çeken, 2005; Uçar, 2004). Green, blue, and purple are defined as cool colors, and these colors fall on the retina of the eye a little bit later than others, and they are perceived as stagnant (Hidayetoğlu, 2010). In addition, they create comfort and relaxation effect on individuals (Artut, 2004; Sağocak, 2005). Within this context, it can be stated that individuals approach warm colors psychologically in a positive way, whereas they react to cool colors negatively (Akkin et al., 2004; Cyr et al., 2010; Engelbrecht, 2003; Koçak & Paksoy, 2004).

Even though the contextual and learning dimensions are effective in the color preferences, liking also plays an important role, which is completely under control of an individual (Amsteus et al., 2015). Individuals tend to choose the color which is closest to them in a painting activity. In general, it may be the case that the individuals prefer to use the color which is closest to them all their paintings. It has been emphasized that it is difficult to make fixed judgments about colors as the psychological meanings of colors change from child to child (Gier, 2015; Schultz, 2007; Yavuzer, 1993). As such, children can associate colors with an object they have learned or loved. It has been well-recognized that children prefer their most preferred colors for the objects they like and describe as beautiful, whereas they choose their least preferred colors for the objects they dislike and describe as bad. On the other hand, children prefer neutral colors for the objects they are neutral (Burkitt et al., 2003).

The age, level of education, gender, and level of culture of individuals have an impact on their color preferences, and these variables can change their color preferences. Zemach et al. (2007) concluded that while newborn babies prefer dark stimuli, 3–4-month-old babies prefer red and blue...
colors. Having examined the packaging color preferences of preschool children in product selection regarding their age and gender, Marshall et al. (2006) found that pink, purple and yellow are the most popular colors among these children. Frielig (1979) investigated the liked and disliked colors by showing twenty-three colors to children and teenagers between the ages of five and nineteen. The researcher (1979) reported that individuals like the colors such as grey and black in their upcoming, which were disliked in childhood, whereas although colors such as violet and purple were liked in childhood, these colors were disliked after adolescence. Though it is stated that children like and prefer common colors in certain age periods, color preferences may differ according to their emotional states, feelings, or the way they express themselves. In addition, it is expressed that personal preferences, cultural and social norms are also effective in the interpretation of the colors that individuals prefer to use (Malchiodi, 2013; Schulz, 2007).

Individuals with ID usually choose colors unconsciously or they choose colors with the help of someone. It has been reported that these individuals prefer to use vivid and warm colors that attract their attention more in color preference. As individuals with ID have more difficulty in expressing themselves verbally, colors play an important role in expressing their feelings and thoughts. It was found that individuals with ID tend to choose the same color as individuals who are mentally healthy but younger than themselves (Çelik, 2009).

Individuals with ASD perceive colors differently (Franklin et al., 2008) and intensely, and they have obsessions such as the same color and variety (Çetin & Kurnaz, 2017). Studies have indicated that children with ASD have an obsession with the green color (Higashida, 2013; Silberman, 2015). Bright colors and warm colors create a negative effect for these individuals. In an attempt to compare the color perception between children with ASD and children with typical development, Franklin et al. (2008) found that there was no difference in color perception between children in both groups. Although the basic mechanism for the perceptual classification of colors does not differ between children with ASD and the typically developing children, an increased sensitivity to sensory stimulation, which is a characteristic of ASD (Markram & Markram, 2010), affects the color perception.

While some of the students with LD experience active behavior and stimulation problems; others have the characteristics of being calm and introverted. Students who are introverted due to LD prefer yellow, orange, and purple colors that have high energy and increase attention. Students who are more energetic and active choose blue and green colors that have a calming effect. Relatedly, Gregor and Newell (2000) discovered that individuals with dyslexia prefer dirty green-brown and blue-yellow colors. Overall, creating opportunities for the students with special needs (SSN) to choose the color they use gives those students the feeling that they can control their own life, and in turn, the opportunity to act independently is effective in increasing their self-confidence. In other words, SSN can reduce externalization behaviors by expressing their inner feelings. Through colors, it is possible for SSN to express their feelings, which they have difficulty in expressing and sharing by verbal communication.

Due to the inadequacy of their social skills in their daily lives, SSN experience difficulties in expressing themselves. Thus, colors are an important tool for them in expressing their inner world and different emotions, and comprehending the behaviors and emotions of themselves and other individuals around them. In this context, as a reflection of his/her inner world and emotions, the color used by each SSN differentiates the meaning it carries. The colors preferred to be used in their paintings play an important role in handling the difficulties that arise as a result of the lack of communication between SSN and adults. People unconsciously express the world, situations, emotions or moods with the colors they choose. Colors remind different emotions in each person, and they have psychological effects on people. The relationship between color and emotion (Imhof, 2004; Zentner, 2001) is closely related to color preferences, in other words, whether the color evokes a positive or negative emotion in the individual. Research on color psychology has shown that there is a relationship between colors and emotions (Terwogt & Hoeksmma, 1995; Uzunboylu & Evram, 2017) and although there is no clear reason to explain how colors can affect emotions exactly, they affect
individuals’ emotions, attention, judgments and decisions. (Babin et al., 2003; Noiwan & Norcio, 2006). Therefore, it is necessary to be aware of the color preferences of students with special needs in the organization of learning environments, in the design of tools, materials, and clothes. Considering that the colors preferred by SSN reflect their dreams, conflicts and concerns, and therefore their emotional and psychological characteristics, it is a must to determine their primary and secondary color preferences and their color preference for objects, and to examine the distribution of these preferences according to their disability types, school levels and gender. Considering this gap, this study can contribute to the related literature regarding the color preferences of students with special needs.

METHOD

Research Design

This study adopted a survey research design with quantitative methodology. This type of design aims to describe a past or present situation as it is (Knical, 2015). The individual or object that is the subject of the research is tried to be defined in its own conditions and as it is, without any intervention to change or influence it in any way. Investigating a phenomenon without any attempt to change it is central to survey research design (Karasar, 2006). The reason behind adopting this research design in this study is that the researchers attempted to explore the current situation of the color preferences of SSN from different perspectives in its own conditions.

Participants

In this study, as one of the purposive sampling methods, criterion sampling method was employed in the recruitment of the participants. The essence of the criterion sampling method is to study all cases that meet a set of predetermined criteria (Yıldırım & Şimşek, 2016). The criteria in this study are a) the ability of SSN to fulfill the given instructions, b) the sufficient strength of their hand muscles to hold the crayons, and c) their willingness to participate in the study.

The study involved a total of 549 students including 400 students with ID, 85 students with ASD, 56 students with DS, and 8 students with LD. Table 1 displays the demographic information about the students.

### Table 1: Demographic background of SSN

<table>
<thead>
<tr>
<th>Disability Type</th>
<th>School Level</th>
<th>Pre-school</th>
<th>Primary</th>
<th>Secondary</th>
<th>Vocational Training</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total f</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>15</td>
<td>4%</td>
<td>93</td>
<td>23%</td>
<td>126</td>
<td>32%</td>
</tr>
<tr>
<td>ASD</td>
<td>10</td>
<td>12%</td>
<td>44</td>
<td>52%</td>
<td>28</td>
<td>33%</td>
</tr>
<tr>
<td>DS</td>
<td>11</td>
<td>20%</td>
<td>21</td>
<td>38%</td>
<td>15</td>
<td>27%</td>
</tr>
<tr>
<td>LD</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>25%</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>16%</td>
<td>171</td>
<td>31%</td>
<td>182</td>
<td>34%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Disability Type</th>
<th>ID</th>
<th>ASD</th>
<th>DS</th>
<th>LD</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>227</td>
<td>57%</td>
<td>50</td>
<td>59%</td>
<td>36</td>
<td>64%</td>
</tr>
<tr>
<td>Female</td>
<td>173</td>
<td>43%</td>
<td>35</td>
<td>41%</td>
<td>20</td>
<td>36%</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td></td>
<td>85</td>
<td></td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

With respect to school level, almost half of the students with ID (166; 42%) are trained in vocational training centers while more than half of students with ASD (44; 52%) are from primary school. More than two-thirds of the students with DS (21; 38%) attend primary school whereas half of the students with LD (4; 50%) are educated in a vocational training center. When all types of disability are considered in general, one third of the students participating in the study are trained in a vocational
training center. As for the gender distribution of SSN according to disability types, it is obvious that the number of male students is more than female students in all disability groups. In brief, 318 male and 231 female students participated in the study.

Data Collection Tools

In order to determine the color preferences of SSN according to shapes, geometric shapes used by Ece and Çelik (2008) as a data collection tool were used in this study. In addition, a car picture developed by the researchers was used as the data collection tool. In determining the color preferences of SSN according to shapes, the researchers used square and circle as geometric shapes. A circle divided in half was adopted to identify the primary and secondary color preferences. Moreover, a car visual was used to determine the color preferences of SSN for an object. The rationale behind the use of a car visual is that since there is no specific color for cars, cars can be in all colors. 20 students with special needs did painting activities in the company of 3 experts. At the end of the activity, the opinions of the experts that the two items are valid in determining the change in the color preferences of the students depending on the shape were analyzed by means of Kappa analysis. Three experts, having a degree of doctorate in the field of special education, gave their opinions on the suitability of the items, and the internal consistency of the opinions between the experts was tested using the Cohen Kappa technique. The Kappa value was found to be 0.87 (perfect fit between 0.81 and 1.00). In order to determine the reliability of the items, 20 students repainted the same shapes with an interval of two days, and it was found that 95% of the students painted the same shapes in the same color. As a result, it was concluded that the two items had consistency reliability in determining the color preferences of students.

Data Collection Procedures and Analysis

In the process of data collection, the students were first given a circle and a crayon box of the same type and brand in order to determine whether the color preferences of SSN change according to the shapes. It was ensured that the students were seated in a way that they were not influenced by each other. SSN were asked to choose their favorite color, and the other colors were put in the crayon box. The students were instructed to paint the circles. After the circle was painted, a square was given to the students in order to determine whether the color preferences of them changed when the shape changed, and the same process was repeated.

A circle divided in half was used to determine the primary and secondary color preferences of SSN. To do so, the students were given a circle divided in half by a line and a crayon box of the same type and brand. First, the students were asked to choose their most favourite color and paint the first half of the circle. Next, they were asked to choose their second most favourite color and paint the other half of the circle. At this stage, the other colors that the students did not choose were not put in the box.

In order to collect the data on the color preferences of SSN for an object, they were given a hand-drawn car visual and the same type and brand of crayons, and the students were asked to choose their favorite color and paint the car. It was decided to use geometric shapes as they do not remind SSN of any shape, form or object. The car visual is also drawn in a typical car view. Considering that the cars can be in many different colors, the researchers attempted to determine whether there would be a change in students’ color preferences in the transition from a geometric shape to a meaningful object. Taking the disabilities and demographic characteristics of the students into account, the two geometric shapes and pictures of cars painted by the student with special needs were collected by the researchers, separated into color categories, and classified within themselves. The data of the demographic background and color preferences of the students were entered into the Excel program. The data were analyzed through calculating the frequency and percentage values.
FINDINGS

In the first sub-problem of the study, the question "What are the color preferences of SSN for geometric shapes according to their school level?" was answered. The color preferences of the students are shown in Table 2.

Table 2: The color preferences of SSN for a circle

| Circle | Red | Yellow | Green | Blue | Brown | Pink | Purple | Orange | f | % | f | % | f | % | f | % | f | % | f | % | f | % | f | % | T |
|        |     |        |       |      |       |      |       |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| School Level |     |        |       |      |       |      |       |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| PS     | 6   | 17     | 4     | 11   | 6     | 17   | 4     | 11    | 1   | 2,8 | 3   | 8,3 | 3   | 8,3 | 4   | 11 | 36 |
| PriS   | 24  | 15     | 26    | 16   | 27    | 17   | 25    | 16    | 12  | 7,5 | 4   | 2,5 | 11  | 6,9 | 17  | 11 | 160 |
| SS     | 28  | 16     | 26    | 15   | 31    | 18   | 18    | 16    | 11  | 6,4 | 13  | 7,6 | 10  | 5,8 | 13  | 7,6 | 171 |
| VT     | 30  | 16     | 25    | 14   | 32    | 18   | 28    | 15    | 15  | 8,2 | 10  | 5,5 | 13  | 7,1 | 20  | 11 | 182 |
| Total  | 88  | 16     | 81    | 15   | 96    | 17   | 85    | 15    | 15  | 39  | 7,1 | 30  | 5,5 | 37  | 6,7 | 54  | 9,8 | 549 |

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

As Table 2 displays, 6 of the pre-school students (17%) preferred green and red to paint the circle shape. 27 of the primary school students (17%) chose green, 26 (16%) chose yellow, 25 (16%) chose blue, and 24 (15%) chose red to paint the circle. As for the secondary school students, 31 (18%) of them preferred green, whereas 28 (16%) of them chose red and blue to paint the circle. Of the students from vocational training center, 32 students (18%) chose green, 30 students (16%) chose red, and 28 students (15%) chose blue. Overall, it was found that 96 students (17%) preferred green, 88 students (16%) preferred red, and 85 students (15%) preferred blue.

In the second sub-problem of the study, an answer to the question "Do the color preferences of SSN change when the shape changes according to school level?" was sought. The color preferences of the students are displayed in Table 3.

Table 3: The color preferences of SSN for a square

| Square | Red | Yellow | Green | Blue | Brown | Pink | Purple | Orange | f | % | f | % | f | % | f | % | f | % | f | % | f | % | f | % | f | % | T |
|        |     |        |       |      |       |      |       |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| School Level |     |        |       |      |       |      |       |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| PS     | 4   | 11     | 4     | 11   | 8     | 22   | 3     | 8,3   | 5   | 14  | 2   | 5,6 | 3   | 8,3 | 3   | 8,3 | 37 |
| PriS   | 18  | 11     | 23    | 14   | 35    | 22   | 19    | 12    | 8   | 12  | 7,5 | 15  | 7,5 | 15  | 9,4 | 160 |
| SS     | 25  | 15     | 20    | 12   | 33    | 19   | 30    | 18    | 18  | 11  | 2   | 1,2 | 11  | 6,4 | 18  | 11 | 171 |
| VT     | 23  | 13     | 31    | 17   | 31    | 17   | 25    | 14    | 10  | 5,5 | 13  | 7,2 | 9   | 5   | 28  | 15 | 181 |
| Total  | 70  | 13     | 78    | 14   | 107   | 21   | 77    | 14    | 41  | 7,5 | 29  | 5,3 | 35  | 6,4 | 64  | 12 | 549 |

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

When Table 3 is examined, 8 (22%) of the preschool students painted the square in green; 5 students (14%) in brown; and 4 students (11%) in red and yellow. There was no change in the status of green, red, and yellow. However, it is seen that while 1 student (2.8%) chose brown to paint the circle, 5 students (14%) preferred brown to paint the square. In light of these data, it was found that the color preferences of SSN partially changed in the preschool period.

As for the primary school students, 35 of them (22%) preferred green while 23 students (14%) chose yellow to paint the square. 19 students (12%) used blue color to paint it. There was no change in the status of green, yellow, and blue. It is clear that while 4 students (2.5%) preferred pink to paint the circle, 12 students (7.5%) painted the square in pink. Similarly, 24 students (15%) painted the circle in
red, whereas 18 students (11%) painted the square in red. 12 students (7.5%) chose brown to paint the circle while 8 students (5%) preferred brown to paint the square. It is obvious that there was a change in the color preferences of primary school students with respect to the colors pink, red, and brown.

In the secondary school level, 33 students (19%) preferred green to paint the square whereas 30 students (18%) chose blue to paint it. 25 students (15%) opted red for painting. There was no change in the color preferences of SSN regarding the colors blue and red. It is seen that while half of the students chose yellow to paint the circle, they preferred green more to paint the square. Moreover, there were 13 students (7.6%) who preferred pink to paint the circle, and only 2 students (1.2%) painted it in pink. Overall, it is evident that the color preferences of SSN at the secondary level differed.

As for the students from the vocational training center, 31 of them (17%) opted yellow and green to paint the square, whereas 28 students (15%) painted it in orange. The color green was preferred by 32 students (18%) to paint the circle while 31 students (17%) preferred green for the square. It was found that while red and blue colors are preferred more by SSN for the circle, the colors yellow and orange were chosen for the square. For the circle, 13 students (7.1%) used purple, and 9 students (5%) preferred purple for the square. In light of these findings, it can be stated that there was a partial change in the color preferences of the students. For the circle, 13 students (7.1%) used purple, and 9 students (5%) preferred purple for the square.

In the third sub-problem of the study, the question "What are the primary color preferences of SSN according to their school level?" was answered. In order to answer this question, the researchers asked students to paint the first half of the circle first, and then the students were told to paint the second half of it. Table 4 shows the color preferences of the students.

Table 4: The primary color preferences of SSN according to their school level

<table>
<thead>
<tr>
<th>School Level</th>
<th>Primary Color</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Pink</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS</td>
<td>f %</td>
<td>3</td>
<td>8.3</td>
<td>3</td>
<td>8.3</td>
<td>14</td>
<td>7</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>PriS</td>
<td>f %</td>
<td>33</td>
<td>21</td>
<td>16</td>
<td>10</td>
<td>10</td>
<td>21</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>SS</td>
<td>f %</td>
<td>30</td>
<td>18</td>
<td>22</td>
<td>13</td>
<td>24</td>
<td>14</td>
<td>29</td>
<td>17</td>
</tr>
<tr>
<td>VT</td>
<td>f %</td>
<td>27</td>
<td>19</td>
<td>20</td>
<td>35</td>
<td>19</td>
<td>30</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>f %</td>
<td>93</td>
<td>17</td>
<td>77</td>
<td>14</td>
<td>80</td>
<td>16</td>
<td>87</td>
<td>17</td>
</tr>
</tbody>
</table>

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

As Table 4 indicates, at the preschool level, 7 students (19%) preferred blue, whereas 5 students (14%) chose pink, green and orange as the primary color. As the primary school students, 33 students (21%) opted red, 21 students (13%) preferred blue, and 19 students (12%) chose orange as the primary color. At the secondary school level, 30 students (18%) chose red, 29 students (17%) opted blue, and the primary color was green for 24 students (14%). It is also seen that regarding vocational training level, 36 students (20%) preferred yellow, 35 students (19%) chose green, and it was blue for 30 students (17%) as their primary color. In general, 93 students (17%) preferred red, 87 students (17%) chose blue, and 80 students (16%) favoured green most, whereas only 35 of the students chose purple as the primary color, and purple was the least preferred color.

In the fourth sub-problem of the study, an answer was sought to the question "What are the secondary color preferences of SSN according to their school level?". In order to determine this, the students were asked to paint the first half of the circle and then the second half of it. The color preferences of the students are displayed in Table 5.
Table 5: The secondary color preferences of SSN according to their school level

<table>
<thead>
<tr>
<th>Secondary Color</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>PS</td>
<td>1</td>
<td>2.8</td>
<td>3</td>
<td>8.3</td>
<td>7</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>PriS</td>
<td>17</td>
<td>11</td>
<td>25</td>
<td>16</td>
<td>17</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>SS</td>
<td>17</td>
<td>9.9</td>
<td>20</td>
<td>12</td>
<td>34</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>VT</td>
<td>13</td>
<td>7.1</td>
<td>21</td>
<td>12</td>
<td>30</td>
<td>16</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>8.7</td>
<td>69</td>
<td>13</td>
<td>88</td>
<td>16</td>
<td>110</td>
</tr>
</tbody>
</table>

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

It is clear in Table 5 that 7 preschool students (19%) used green and blue while 32 students (20%) preferred blue and 25 students (16%) from primary school chose yellow to paint the circle. At the secondary school level, 34 students (20%) opted green, whereas 28 students (16%) favoured blue. Regarding the vocational training level, 43 students (24%) preferred blue as the secondary color, and it was green for 30 students (16%). Overall, 110 SSN (20%) preferred blue, and the color green was chosen by 88 students (16%) as the secondary color to paint the circle. Purple was the least preferred color as the secondary color preference.

In the fifth sub-problem of the study, the question "What are the color preferences of SSN to paint an object according to their school level?" was answered. To do this, students were asked to paint a car visual. The color preferences of the students are shown in Table 6.

Table 6: The color preferences of SSN for the car visual

<table>
<thead>
<tr>
<th>Car</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Black</th>
<th>Brown</th>
<th>Pink</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>PS</td>
<td>4</td>
<td>11</td>
<td>3</td>
<td>8.3</td>
<td>5</td>
<td>14</td>
<td>6</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>PriS</td>
<td>25</td>
<td>16</td>
<td>9</td>
<td>5.6</td>
<td>24</td>
<td>15</td>
<td>25</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>SS</td>
<td>23</td>
<td>13</td>
<td>21</td>
<td>12</td>
<td>26</td>
<td>15</td>
<td>31</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>VT</td>
<td>28</td>
<td>15</td>
<td>24</td>
<td>13</td>
<td>25</td>
<td>14</td>
<td>38</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>15</td>
<td>57</td>
<td>10</td>
<td>80</td>
<td>15</td>
<td>100</td>
<td>18</td>
<td>39</td>
</tr>
</tbody>
</table>

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

It is clear in Table 6 that the colors blue and green were preferred by 6 (17%) and 5 pre-school students (14%) to paint the car, respectively. At the primary level, while 25 students (16%) favoured red and blue, 24 students (15%) opted green to paint the car. Regarding secondary school level, 31 students (18%) chose blue, and it was green for 26 students (15%). Furthermore, 38 students (21%) from vocational training center preferred blue, and the color red was chosen by 28 students (15%) to paint the car. When evaluated in general, while 100 SSN (18%) preferred blue, 80 SSN (15%) used the colors red and green to paint the car.

In the seventh sub-problem of the study, the answer to the question "What are the color preferences of SSN for the circle according to the disability type?" was sought. Table 7 shows the color preferences of the students.
Table 7: The color preferences of SSN for the circle according to the disability type

<table>
<thead>
<tr>
<th>Circle</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Pink</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Disability Type</td>
<td>ID</td>
<td>ASD</td>
<td>DS</td>
<td>LD</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>63</td>
<td>20</td>
<td>4</td>
<td>1</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>24</td>
<td>7,1</td>
<td>13</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>12</td>
<td>15</td>
<td>25</td>
<td>16</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>67</td>
<td>12</td>
<td>15</td>
<td>25</td>
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<td></td>
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<tr>
<td></td>
<td>17</td>
<td>14</td>
<td>27</td>
<td>1</td>
<td>78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>63</td>
<td>10</td>
<td>12</td>
<td>17</td>
<td>15</td>
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<td>96</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>17</td>
<td>81</td>
<td>37</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7,5</td>
<td>6,4</td>
<td>7,1</td>
<td>6,7</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>43</td>
<td>9</td>
<td>11</td>
<td>54</td>
<td>14</td>
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<td>11</td>
<td>11</td>
<td>56</td>
<td>9,8</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>85</td>
<td>549</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 7 is looked through, it is seen that of the students with ID, 67 (17%) preferred green, and red and blue were favoured by 63 (16%) to paint the circle. As for the students with ASD, 20 students (24%) chose red, whereas 12 students (14%) opted green in painting the circle. 15 students with DS (27%) chose green while 11 students with DS (20%) used the color blue. Additionally, 2 students with LD (25%) preferred yellow and green to paint the circle shape. In general, 96 students (17%) chose green, 88 students (16%) opted red, and it was blue for 85 students (15%) to paint the circle shape in all disability types.

In the eighth sub-problem of the study, the question "What are the color preferences of SSN for the square according to the disability type?" was answered. The color preferences of students are shown in Table 8.

Table 8: The color preferences of SSN for the square according to the disability type

<table>
<thead>
<tr>
<th>Square</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Pink</th>
<th>Purple</th>
<th>Orange</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Disability Type</td>
<td>ID</td>
<td>ASD</td>
<td>DS</td>
<td>LD</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>50</td>
<td>15</td>
<td>13</td>
<td>1</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>18</td>
<td>13</td>
<td>2</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>15</td>
<td>15</td>
<td>25</td>
<td>78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>79</td>
<td>10</td>
<td>15</td>
<td>9</td>
<td>107</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>21</td>
<td>17</td>
<td>9</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>77</td>
<td>14</td>
<td>22</td>
<td>77</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>41</td>
<td>14</td>
<td>0</td>
<td>14</td>
<td></td>
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</tr>
<tr>
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<td>28</td>
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<td>75</td>
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<td>75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>35</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5,8</td>
<td>4,7</td>
<td>6,4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>8</td>
<td>35</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>4</td>
<td>35</td>
<td>0</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>4</td>
<td>35</td>
<td>0</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>0,3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td></td>
<td>0,3</td>
<td>4</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>85</td>
<td>549</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As it is indicated in Table 8, of the students with ID, 79 students (20%) chose green, 61 students (15%) preferred blue, and 56 students (14%) used the color yellow to paint the square. With respect to the students with ASD, 15 students (18%) opted red, whereas 13 students (15%) favoured yellow and green to paint the square. While 4 students with DS (25%) preferred green, it was blue for 9 students with DS (16%). Moreover, 2 students with LD (25%) preferred yellow, blue, and orange to paint the square. It is seen that there was no change in the colors preferred by the students with ID, students with ASD, and students with DS to paint the circle and square. None of the students with LD chose the colors brown and pink for either shape. While none of the students with LD preferred orange for the circle, 2 students with LD (25%) chose it for the square. While none of the students preferred white for the circle in all disability groups, 1 student with ID (0.3%) and 4 students with ASD (4.7%) painted the square with white. When evaluated in general, it is seen that 107 of the students (21%) preferred green, 78 of the students (14%) opted yellow, and 77 of the students (14%) used blue.

In the ninth sub-problem of the study, an answer was sought to the question "What are the primary color preferences of SSN according to the disability type?" The color preferences of the students are displayed in Table 9.
Table 9: The primary color preferences of SSN according to the disability type

<table>
<thead>
<tr>
<th>Primary</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Pink</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>ID</td>
<td>71</td>
<td>18</td>
<td>63</td>
<td>16</td>
<td>62</td>
<td>16</td>
<td>64</td>
<td>16</td>
</tr>
<tr>
<td>ASD</td>
<td>17</td>
<td>20</td>
<td>5</td>
<td>5,9</td>
<td>10</td>
<td>12</td>
<td>8</td>
<td>9,4</td>
</tr>
<tr>
<td>DS</td>
<td>5</td>
<td>8,9</td>
<td>9</td>
<td>16</td>
<td>7</td>
<td>13</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>LD</td>
<td>1</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>18</td>
<td>77</td>
<td>14</td>
<td>79</td>
<td>14</td>
<td>87</td>
<td>16</td>
</tr>
</tbody>
</table>

As Table 9 shows, the colors red (71 students (18%)), blue (64 students (16%)), and yellow (63 students (16%)) were preferred by the students with ID as the primary color. Of the students with ASD, 17 students (20%) chose red, 12 students (14%) opted orange, and 10 students (12%) favoured green. In addition, the colors blue (12 students (21%)), yellow (9 students (16%)), and green (7 students (13%)) were chosen by the students with DS as the primary color. It is evident that 3 students with LD (38%) preferred blue, whereas 2 students with LD (25%) opted purple as the primary color. In general, 94 students (18%) preferred the color red, 87 students (16%) favoured blue, and it was green for 79 students (14%).

In the tenth sub-problem of the study, the researchers tried to answer the question "What are the secondary color preferences of SSN according to the disability type?" The secondary color preferences of the students are shown in Table 10.

Table 10: The secondary color preferences of SSN according to the disability type

<table>
<thead>
<tr>
<th>Secondary</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Purple</th>
<th>Skin Color</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>ID</td>
<td>31</td>
<td>7,8</td>
<td>53</td>
<td>13</td>
<td>58</td>
<td>15</td>
<td>90</td>
<td>11,4</td>
</tr>
<tr>
<td>ASD</td>
<td>12</td>
<td>14</td>
<td>9</td>
<td>11</td>
<td>18</td>
<td>21</td>
<td>8</td>
<td>9,4</td>
</tr>
<tr>
<td>DS</td>
<td>5</td>
<td>8,9</td>
<td>7</td>
<td>13</td>
<td>10</td>
<td>18</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>LD</td>
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<td>0</td>
<td>0</td>
<td>2</td>
<td>25</td>
<td>3</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>8,7</td>
<td>69</td>
<td>13</td>
<td>88</td>
<td>16</td>
<td>110</td>
<td>20</td>
</tr>
</tbody>
</table>

As Table 10 shows, the colors blue (90 students (23%)), green (58 students (15%)), and yellow (53 students (13%)) were chosen as the secondary color by students with ID. As for the students with ASD, they preferred the colors green (18 students (21%)) and red (12 students (14%)). Of the students with DS, 10 (18%) preferred green, whereas 9 (16%) favoured blue as the secondary color. Furthermore, 3 (38%) of the students with LD preferred blue while 2 (25%) of the students from the same group opted green and orange as the secondary color. Overall, 110 students (20%) preferred the color blue, 88 students (16%) chose green, and it was yellow for the 69 students (13%).

In the eleventh sub-problem of the study, an answer was sought to the question "What are the color preferences of SSN to paint an object according to the disability type?". Table 11 displays the color preferences of the students.
When Table 11 is looked through, it is clear that the colors preferred by the students with ID to paint the car visual were blue (80 students (20%)), red (61 students (15%)), and green (59 students). While 14 students with ASD (16%) chose red, 13 students from the same group (15%) favoured green and blue. Of the students with DS, 10 students (18%) used orange, 8 students (14%) preferred green, and 7 students (13%) chose brown for the car object. It is obvious that 3 students with LD (38%) preferred blue, whereas 2 students from the same group (25%) opted brown and orange. In general, 100 students (18%) painted the car in blue, 80 students (15%) used the color red, and 80 students (15%) preferred green.

In the twelfth sub-problem of the study, the question "What are the color preferences of SSN for the geometric shapes according to their gender?" was answered. The color preferences of the students are shown in Table 12.

As it is displayed in Table 12, male students preferred the colors green (61 students (19%)), red (53 students (17%)), and blue (51 students 16%) to paint the circle. On the other hand, female students chose the colors yellow (37 students (16%)), and red and green (35 students (15%)) to paint the circle. When it is evaluated in general, it is seen that 96 students (17%) painted the circle in green, 88 students (16%) used red, and 85 students (15%) preferred blue to paint it.

In the thirteenth sub-problem of the study, the researchers tried to answer the question "Do the color preferences of SSN change when the shape changes according to their gender?" The color preferences of the students are shown in Table 13.
According to Table 13, male students preferred the colors green (61 students (19%)), yellow (52 students (16%)), and blue (44 students (14%)), whereas female students chose the colors green (46 students (20%)), and blue and orange (33 students (14%)) to paint the square. It was found that male students preferred green more to paint the circle and square. There was no change in the status of green and blue. It can be seen that while there was no change in the preferences of female students in terms of green color, there was a partial change in their choice of other colors. While 24 female students preferred the color orange to paint the circle, the same color was preferred by 33 female students to paint the square. Similarly, the color pink was preferred by 16 female students to paint the circle whereas the same color was chosen by 10 female students to color the square. Overall, it is seen that 107 students (21%) preferred green, 78 students (14%) opted yellow, and the color blue was favoured by 77 students (14%).

In the fourteenth sub-problem of the study, the question "What are the primary color preferences of SSN according to their gender?" was answered. The color preferences of the students are displayed in Table 14.

### Table 14: The primary color preferences of SSN according to their gender

<table>
<thead>
<tr>
<th>Primary</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Pink</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Male</td>
<td>51</td>
<td>16</td>
<td>53</td>
<td>17</td>
<td>45</td>
<td>14</td>
<td>48</td>
<td>15</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>19</td>
<td>24</td>
<td>10</td>
<td>34</td>
<td>15</td>
<td>39</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>18</td>
<td>77</td>
<td>14</td>
<td>79</td>
<td>14</td>
<td>87</td>
<td>16</td>
</tr>
</tbody>
</table>

As it is indicated in Table 14, while male students preferred the colors yellow (53 students (17%)), red (51 students (16%)), and blue (48 students (15%)), female students chose red (43 students (19%)), blue (39 students (17%)), and green (34 students (15%)) as the primary color. In general, 94 students (18%) preferred red, and 87 students (16%) chose blue as their primary color. It was the color green for 79 students (14%).

In the fifteenth sub-problem of the study, the answer to the question "What are the secondary color preferences of SSN according to their gender?" was sought. Table 15 shows the color preferences of the students.

### Table 15: The secondary color preferences of SSN according to their gender

<table>
<thead>
<tr>
<th>Secondary</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Brown</th>
<th>Purple</th>
<th>Skin Color</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>9,4</td>
<td>39</td>
<td>12</td>
<td>51</td>
<td>16</td>
<td>60</td>
<td>19</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>7,8</td>
<td>30</td>
<td>13</td>
<td>37</td>
<td>16</td>
<td>50</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>8,7</td>
<td>69</td>
<td>13</td>
<td>88</td>
<td>16</td>
<td>110</td>
<td>20</td>
</tr>
</tbody>
</table>

When Table 15 is looked through, it is seen that male students preferred the colors blue (60 students (19%)), green (51 students (16%)), and yellow (39 students (12%)), whereas female students chose blue (50 students (22%)), green (37 students (16%)), and yellow (30 students (13%)) as the secondary color. In addition, it was found that both male and female students had the same color preference as the secondary color. In general, 110 students (20%) preferred the color blue while 88 students (16%) chose green as the secondary color. The color yellow was favoured by 69 students (13%) as the secondary color.
In the sixteenth sub-problem of the study, an answer was sought to the question "What are the color preferences of SSN to paint an object according to their gender?". The color preferences of the students are given in Table 16.

Table 16: The color preferences of SSN for the car according to their gender

<table>
<thead>
<tr>
<th>Car</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Black</th>
<th>Brown</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>47</td>
<td>15</td>
<td>33</td>
<td>10</td>
<td>43</td>
<td>14</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>33</td>
<td>14</td>
<td>24</td>
<td>10</td>
<td>37</td>
<td>16</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>15</td>
<td>57</td>
<td>10</td>
<td>80</td>
<td>15</td>
<td>100</td>
<td>18</td>
</tr>
</tbody>
</table>

As Table 16 indicates, while male students preferred the colors blue (55 students (17%)), red (47 students (15%)), and green (43 students (14%)), female students used the colors blue (45 students (19%)), green (37 students (16%)), and red (33 students (14%)) to paint the car visual. Overall, 100 students (18%) used the color blue, whereas 80 students (15%) opted red to paint the car visual. The color green was preferred by 80 students (15%).

In the seventeenth sub-problem of the study, the researchers attempted to answer the question "What are the color preferences of SSN according to all cases?". The color preferences of the students are shown in Table 17.

Table 17: The color preferences of SSN according to all cases

<table>
<thead>
<tr>
<th>Circle</th>
<th>Red</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Black</th>
<th>Brown</th>
<th>Pink</th>
<th>Purple</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Circle</td>
<td>88</td>
<td>16</td>
<td>15</td>
<td>96</td>
<td>17</td>
<td>85</td>
<td>15</td>
<td>39</td>
<td>7</td>
</tr>
<tr>
<td>Square</td>
<td>70</td>
<td>13</td>
<td>14</td>
<td>106</td>
<td>19</td>
<td>77</td>
<td>14</td>
<td>41</td>
<td>8</td>
</tr>
<tr>
<td>I</td>
<td>93</td>
<td>17</td>
<td>14</td>
<td>79</td>
<td>14</td>
<td>87</td>
<td>16</td>
<td>41</td>
<td>8</td>
</tr>
<tr>
<td>II</td>
<td>48</td>
<td>9</td>
<td>69</td>
<td>13</td>
<td>88</td>
<td>16</td>
<td>110</td>
<td>20</td>
<td>49</td>
</tr>
<tr>
<td>Car</td>
<td>80</td>
<td>15</td>
<td>57</td>
<td>10</td>
<td>80</td>
<td>15</td>
<td>100</td>
<td>18</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>70</td>
<td>362</td>
<td>66</td>
<td>449</td>
<td>81</td>
<td>459</td>
<td>83</td>
<td>39</td>
</tr>
</tbody>
</table>

* I: Primary Color, II: Secondary Color

As it is displayed in Table 17, SSN preferred the colors green (96 students (17%)), red (88 students (16%)), and blue (85 students (15%) to paint the circle shape. None of the students painted the circle shape in black. To paint the square shape, while 106 students (19%) preferred green, 78 students (14%) chose yellow. The color blue was favoured by 77 students (14%) to paint it. As it was the case for the circle, none of the students preferred black to paint the square shape. As the primary color, 93 students (17%) preferred red, whereas 87 students (16%) opted blue. The color green was chosen by 79 students (14%) as the primary color. Black and pink colors were not preferred by SSN as the primary colors. With respect to the secondary color, it was found that the colors blue (110 students (20%)), green (88 students (16%)), and yellow (69 students (13%)) were preferred. As it was the case for their primary color preferences, SSN did not prefer black and pink as the secondary color. In addition, the colors blue (100 students (18%)), red (80 students (15%)), and green (80 students (15%)) were preferred to paint the car visual. None of the students painted the car in pink. When it is evaluated in general, while the colors blue (459; 83%) and green (449; 81%) were the most preferred colors, students chose black (39; 7%) and pink (59; 11%) colors the least in all cases.
DISCUSSION, CONCLUSION AND IMPLICATIONS

This study aimed to explore the color preferences of SSN, and the findings were discussed and interpreted in connection with the results of the related studies in the literature. In line with the data obtained from this study and considering the contribution of the knowledge on color preferences of SSN, some suggestions have been made.

The colors preferred by SSN when painting the circle differed according to their school level, and students preferred the colors green and red the most. More specifically, at the pre-school level, students preferred green and red, whereas the color green was favoured by the students from primary school. It was also found that students from both secondary school and vocational training center chose green the most. In the literature, it has been expressed that young children mostly prefer bright colors, but their preference changes to pastel colors and tones in primary school years. Then, in secondary school years, color preference of students turns into cool colors such as green-blue. The color preference of high school students evolves towards darker colors such as claret red, gray, dark blue, dark green, dark turquoise, and violet (Gale, 1933). Corresponding to the related literature on the color preferences, the findings of this study revealed that SSN preferred green, as one of the cool colors, more to paint the circle shape. The green color has the effect of relaxing the nervous system and reducing the feeling of stress. It also contributes to the development of communication and speaking skills of individuals. Çelik (2009) stated that children with ID, who prefer green color, are in harmony with their environment.

With respect to the circle shape, the color green was preferred more by preschool students, primary school students, and secondary school students, and the color yellow and green were chosen more by the students from vocational training center. In light of this, it was found that the primary color preference of the students changed partially when the shape changed, and that students preferred cool colors more as it was the case for the circle shape. According to school level, the study showed that the preference of SSN for some colors changed when the shape changed. When painting the circle and square shapes, preschool students preferred brown; students from primary school chose pink, red, and brown; secondary school students favoured pink; and students from vocational training center used the color purple. That is, there was a change in students’ color preferences to paint the circle and square shapes. It is possible to associate this situation with the fact that the colors that SSN prefer to paint geometric shapes are psychologically relaxing. It can be discussed that if the visuals to be hung on the walls and the activities to be prepared are in the form of a circle or square, teachers’ preference to use the green color for these can attract students’ attention and facilitate their motivation in learning-teaching environments.

Regarding school level, the colors blue (by the students from preschool), red (by the students from primary and secondary school), and yellow (by the students from vocational training center) were preferred as the primary color the most, whereas the colors green (by the students from preschool and secondary school) and blue (by the students from primary school and vocational training center) were chosen as the secondary color the most. Incompatible with the findings of the present study, investigating the drawings of children, Alschuler and Hattwick (1947) found that young children prefer warm colors, whereas older children prefer cool colors. Furthermore, the current study revealed that in the pre-school period, children mostly prefer red, that is, the warm color; and as they get older, their interest in red decreases, and they start to be keen on cool colors more. Studies have indicated that red is the most favorite color for children (Sharpe, 1980), and that the color preference of children changes as they grow up, and their preference moves towards blue (Katzz & Breed, 1922). Although it has been underscored that color preference is a situation that changes according to age, it is seen in this study that the colors preferred by SSN are cool colors. It can be claimed that taking into account the cool colors that SSN prefer, like, and have a positive reaction to in teaching contexts can be effective to make it easier for students to recall the knowledge they have learned and keep their attention. Likewise, it is reasonable to express that it may be beneficial for parents to prefer colors such as green and blue when they want to create a calming environment and to create positive mood and an effect to improve the behaviors of SSN in their home. Providing educational environments with
consciously chosen stimulants for students with special needs is important for their healthy development. On the color wheel, red represents movement and vitality. Orange, on the other hand, symbolizes strength, joy, wisdom, creativity, confidence, courage and endurance. At the same time, orange has a relaxing and stimulating feature (Sözen, 2003). However, orange, which has a positive effect on the socialization of individuals, has a negative effect on the nervous system when used excessively. Yellow represents hope, joy, humility, and wisdom. It is inspiring as well. Green symbolizes the hope for life. It has a soothing, confidence and peace giving feature (Bozkurt, 2004). Blue represents talent, beauty, peace, love and freedom. Excessive emotionality, dreaminess, being in constant search are the negative qualities of the blue color. Last but not least, purple symbolizes nobility, self-confidence, spiritual energy, tolerance and intuition (Çağan, 2005).

To paint the car visual, while the color blue was preferred by the students from three different school levels (i.e., pre-school, secondary school, and vocational training center), primary school students chose red to paint it. Colomb (1990) states that five-year-old children usually use one color when painting family or human figures, but when asked to paint a garden, they often use a larger number colors and do not change the existing color, especially when drawing distinctive objects. School age is a very effective period for children to meet various colors and establish emotional bonds (Zentner, 2001). SSN have developed different color preferences at different education levels, and they have learnt the colors and have associated the colors with the objects they like. Within this context, it is highly possible that as SSN may have encountered the cars in blue more in their daily life, they have associated the car with the color blue.

To paint the circle, the color green was preferred by the students with ID and DS, whereas students with ASD used red. Students with LD chose yellow and green to paint it. When the shape was changed, and the students were asked to paint the square shape, the students with ID favoured green while students with ASD opted red as it was the case for the circle. There was no change in the color preferences of students with ID, students with DS, and those with ASD. When the shape was changed, the color preference of the students with LD changed, accordingly. That is, while none of the students preferred orange to paint the circle, there were students who chose orange when painting the square. Even though it has stated in the related literature that students with ID prefer warm colors more (Çelik, 2009), it is salient that SSN preferred green color in the current study. Equally important, although the colors such as red, yellow, and orange can have the effect of causing anger or furiousness for the students with ASD because these colors provide high levels of stimulus, SSN in this study preferred these colors to paint a geometric shape. Having found that pictorial intervention helped SSN focus and develop communication skills, Mirenda (1990) and Winner (1993) explored the effects of strategies such as using familiar pictures such as a tree, cat, dog, and house and employed symbols such as colored circles and especially combined these objects with bright colors to enable students to focus. In this way, it has been reported that students with ASD focus more on their lesson and behave more sensitively (Winner, 1993). The fact that the students with ID and students with ASD chose different colors than expected may be by chance, and it can be interpreted as the students chose the color they saw to paint the objects. In fact, while students with typical development make the color preferences consciously, this preference can be made randomly by SSN. Therefore, further studies should be conducted to determine the color preferences of SSN in order to obtain more general results.

Regarding the primary color preferences of SSN, students with ID and those with ASD preferred red, whereas students with DS and those with LD opted blue. Dutchzak (1985), in his research with students with severe physical and mental disabilities, found that green color contributes to development, and blue color provides relaxation. Çelik (2008) found that students with ID mostly preferred red in their single-color preference, and students with DS chose orange while in a similar study, Ece and Çelik (2008) discovered that students with LD preferred red, and students with DS chose orange the most. In their research on the color preferences of the students with ASD, Grandgeorge and Masataka (2016) explored that students preferred the color red the most. When compared the findings of the abovementioned studies, there is a congruence with the findings of the students with ID in this study, and yet, it was found that the color preferences of the students with other disability types differ. Overall, the color preferences of the students with ID and those with ASD

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focused mainly on warm colors, whereas the students with DS and those with LD were dominated by cool colors.

As for the secondary color preferences of SSN, while the students with ID and those with LD preferred blue, the students with ASD and those with DS chose green. It was revealed that there was a change in the primary and secondary color preferences of the students with ID, students with ASD, and those with DS, whereas the color preference of the student with LD was the same. Inconsistent with the findings of the present study, Çelik (2009) found that the colors orange and yellow were preferred the most by the students with ID and those with DS as their secondary color preference, respectively. It can be discussed that the determination of the colors mostly-preferred by SSN and incorporation of these colors into learning environments can guide teachers in planning teaching activities, designing instructional materials and increasing the efficiency of learning-teaching activities.

With regard to the color preferences of SSN to paint the car visual, the color blue was preferred by the students with ID and those with LD. Students with ASD opted red, and students with DS chose orange to paint it. Çağlayan (2014) stated that the inclusion of the works that contribute to affective and psychomotor development of students in the Art lessons help SSN make better preferences in line with their senses and emotions. In painting any object, students make choices based on their past experiences and senses. For example, such information as the sky is blue and the tree is green is reflected in the preferences of students, and this cognitive knowledge combines with the affective ones to form the students’ preferences. Cockeril and Miller (1983), in their study to determine the effect of color on the performance of motor skills tasks, asked children to do tasks determined by the researchers by wearing glasses with four different colors in blue, green, yellow and red. As a consequence, they concluded that if the children used their preferred glasses, they could perform the tasks more efficiently, in a shorter time, and with fewer mistakes.

To paint the circle shape, male students preferred green, red, and blue, whereas female students chose yellow, red, and green. This indicates that while male students preferred cool colors, female students preferred warm colors. When the students were asked to paint the square shape, there was no change in the color preference of male students as they chose green and blue again. It was found that female students preferred green as the secondary color. In her study, Çığa (2001) concluded that healthy girls, aged between five and eleven, prefer yellow, red, pink and blue most in their clothes. With respect to gender, it can be expressed that the cool color preferences of male students continued, but female students switched from a warm color to a cool color. In light of these findings, it can be claimed that taking into account the color preferences of male and female SSN for the items such as clothes, jewelry, buckles that they use in their daily lives or for teaching the skills such as letters and numbers in academic fields can facilitate the acquisition of skills.

The primary color preferences of male students were yellow, red, and blue. On the other hand, female students preferred red, blue, and green as the primary color. Regarding the secondary color, male students favoured blue, green, and yellow whereas female students preferred blue, green, and yellow. It was found that there was a partial change in the primary and secondary color preferences of the students in terms of gender. Çelik (2009) discovered that, in the first phase, both male and female students preferred the color red as the primary color preference, and in the second phase, similarly, female students chose red, and male students opted yellow color. In general, it was revealed that female and male students mostly preferred warm colors (yellow and red) as the primary color. It is remarkable that the color preferences of both female and male students were the same as the secondary color preferences, and that they preferred cool colors.

Male students preferred blue, red, and green colors to paint the car visual. Likewise, female students preferred the color blue to paint the car visual, and then they chose green and red colors the most and painted the car visual. The fact that both male and female students preferred blue to paint the car visual can be associated with the students’ past experiences or lives. Considering that students can remember an object they know in their daily lives and transfer it to their pictures, it can be thought that
they remember the cars in blue color and reflect it on their color preferences. Given that the color blue is generally attributed to men in social life, the result of the study demonstrated that gender is not an effective factor in the color preference of SSN, as it is the case for typical children.

Overall, in light of the findings of the current study, it was seen that SSN preferred green the most for painting both the circle and square shapes. For both shapes, black was not among the color preferences of the students. The primary color preferences of the students were mostly red, whereas their secondary color preference was blue. It was obvious that SSN did not prefer black and pink colors as both the primary and secondary colors. SSN painted the car visual using blue the most, but none of them preferred the color pink. Considering all cases, SSN preferred the colors blue and green the most, whereas they chose black and pink the least.

REFERENCES


Serttaş Ertike, A. (2010). *Reklam (Temel kavramlar, teknik bilgiler, örnekler).* Detay Yayıncılık:


Effect of Participatory Art on the Life Satisfaction of Working Women

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Abstract

Art is an educational activity that can be done in any era or by any generation. Theatre art, which has contributed to the individual and social development of individuals since early times, has had a privileged place in the world of education. New approaches in the science of theatre and pedagogy have emerged in the current age and substantially contributed to participatory art. This current study was conducted regarding participatory art carried out as a theatrical staged work in the eastern Black Sea region of Turkey, Artvin Province, Hopa district. The participants in the study were 14 adult females aged between 28 to 55-years-old. Participants were observed during the staging process of a theatrical work and interviews were conducted. The data obtained were analysed and the effect of participatory art on the women’s life satisfaction was determined. It was revealed through the results that there was a significant increase in the life satisfaction of working women who participated in this theatrical work. In research regarding the historical processes of participatory art, the importance of working women expressing themselves through a socio-cultural activity as well as the pedagogical approaches preferred in these studies were also mentioned.

Keywords: Adult Education, Art Education, Participatory Art, Women's Studies

DOI: 10.29329/ijpe.2022.467.14

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INTRODUCTION

Adult education, which was perceived in the past as being solely limited to literacy or vocational skills education provided to adults following their formal education, has now begun to be defined more broadly and include a wide range of topics such as how to adapt to society. The concept of adult education, which is defined as public education and/or non-formal education, has been discussed at adult education conferences organized by UNESCO each decade since 1949, and after 1997, adult education has been considered in terms of “lifelong learning”. As a result, new definitions of lifelong learning encompass all forms of learning such as adult education, formal, non-formal, intermittent, and continuing education, which is not limited to only adults (Uysal & Yıldız, 2006).

The idea of social transformation has an important place in adult education. The main purpose of social transformation is that individuals possess democratic values and develop ideas for creating a better society. It is possible to see traces of social transformation in many of the educational projects implemented during the early phases of the Turkish republic. Following Turkey’s war of independence, issues related to education were instrumental in the survival the Republic’s new government, and the transformative and healing power of culture and art was utilized in these educational efforts. In the 1930s, the literacy rate in Turkey was approximately 10 percent, and many revolutionary moves such as secularism, women's rights, removal of capitulations, closure of religious-based madrasahs and missionary schools as well as the integration of education were carried out to socially transform to the new nation. The idea of developing the social and cultural aspects of people’s lives, especially for those outside formal education and mostly among people in villages, brought about many educational projects. The aim of institutions such as Nation Schools, Community Centres, and Village Institutes was to educate both younger and older generations in how to read and write, gain a profession, and in doing so, instil the values of the new Republic. While it was observed that participation in these institutions was important, it was recognised that participation in folklore, music, painting, theatre, and literature studies also has an important place in educational activities (Sarıkaya, 2010; Yıldız, 2012).

Importantly, in studies regarding public education, bringing together intellectuals and getting citizens to believe in social change has become a national cultural policy in some countries. Among the intellectuals who adopted this change, traces of romantic volunteerism and dedication can be seen in their efforts towards public education. Mayo (2011) states that Gramsci and Friere (DATE) emphasise the cultural and spiritual foundations of volunteering and revolutionary activity. In line with this approach, it can be stated that what was attempted in the public education activities in Turkey during the early Republican period was the effort to raise “organic intellectuals”. Accordingly, so-called palace literature was excluded, and a new focus was placed on the values of folk language, folk literature, and folk culture. The goal sought to be achieved by developing a national culture within the early Turkish republic has been coined the “Anatolian Renaissance” (Akçam, 2013). The enlightened staff during this period were soldiers and civil bureaucrats who became the defenders of secularism as well as the newly established constitutional and parliamentary system. These defenders, who participated in the war of liberation and came to power within the new Republic, were opposed to imperialist occupation by western countries as well as the rules set down by the former Ottoman sultans. The westernization approach of these defenders can be summarized as the ownership and cultivation of their own culture to become an independent member of contemporary societies. As a result, there was a dedicated effort in the early republic period of Turkey that was concentrated on establishing participatory cultural activities which provided an avenue for social transformation among the people.

During this early Republican era in Turkey, Baltacıoğlu, Kansu, and Saygun have a special place in public education due to their roles as leading educators, artists, and thinkers. They raised important opinions regarding the philosophy of the Community Centres’ founded in 1932, which quickly became Turkey's most comprehensive adult education institutions. A need for dialogue among the public regarding adult education also determined the framework for the art to be carried out in this institution. Importantly, the new managerial staff of Turkish republic believed that social development
would be achieved by starting with the resources of the people's own culture and then developing them further. Community centres were built for the purpose of identifying cultural resources, evaluating folk literature and art, and then developing them in coordination with the public. It was envisaged that the people could be educated with their own cultural resources through activities such as holidays, festivities, performances, trips, balls, talks, conferences, and radio programs. Baltacıoğlu (1950), who gives special importance to theatre art, also referred to the importance of improvisational theatre, which is the main argument for folk theatre in his theory, “Self-Theatre”. He emphasized the importance of the “Karaköz”, “Ortaoynu”, “Meddahlık” tradition as well as the having the village watch plays for the education of all generations. He also drew attention to the existence of new ideas in theatre discovered by the pioneering theorists in western theatre and how this tradition could play a role in Turkish Folk Theatre (Baltacıoğlu, 1950). Saygün (1940) mentions the importance of the use of choir and collective speech in music education and suggests that choirs established in Community Houses provide regional concerts. In addition, he suggests that folk tales, rhymes, folk dances, and poets who play the saz (e.g., a folk stringed instrument) can also perform in these concerts. Taking advantage of poets who play the saz may also enable the discovery of talents among the public.

Historically, the traditional Karaköz and Ortaoynu performances based on improvisation have a special place in the community houses of Turkey. These local theatre types, which take their subjects from the values of the new Republic, and the classical western style of theatre accompanying them, had become the fundamental tools of public education. In these representations, which aim to teach the values of the new Republic to the society, raise awareness of citizenship, and enjoy the taste of social life, the topics covered were things such as the importance of the Republican leadership as well as the fight against ignorance and theocratic understanding. The actors of the representations were volunteers of the Community Houses (Karadağ, 1998).

Kansu (1939) emphasizes the appearance of women on the stage in the Community Houses was an important event, because in the recent past a woman's appearance on the stage was considered unacceptable. He also emphasizes that it is easy to understand how a stage movement held by the State and political party members has deep meaning. Importantly, between 1932 and 1950 a network of “cultural circles” was established by the community houses who were in contact with one another through their branches operating in each province, district, and village. The state-sponsored existence of Community Houses as an institution for the implementation of cultural policy, ended with the transition to a multi-party period in Turkish politics that was bought about by the arrival of the Democratic Party to power (Sarkaya, 2010). Thus, even with the initial state-support, the social lives of Turkish citizens transformed by participation in cultural and artistic activities was greatly interrupted. This change in direction, which directed men to coffee shops and religious communities, and women to their homes, affected the day-to-day existence of citizens and made women less visible in the public arena. Similar interventions and deactivation policies were the closure of the “Village Institutes”, which originally worked in coordination with community centres, prepared locals to be village teachers, and were established for the development and awareness of the village as a whole. Today, it is still possible to find traces of these interventions in disadvantaged areas where women lack access to education, marriage, and professional life. Sadly, women are also increasingly victims of feudal cultural concepts that cannot seem to be eliminated from the minds of some in these communities. Over a decade, the rate of female homicide committed under the auspicious of honour killings increased 1500% in some areas. In addition, the number of women with protection orders has increased by 171% over an eight-year period as well (Sarkaya, 2011).

Importantly, through research data regarding how active people are within their daily life as well as in which ways they participate in social life in Turkey (IPSOS, 2016), important clues can be revealed about the cultural life of a community. Accordingly, it is shown in the analysis results of research conducted with 13,799 people in 34 provinces throughout Turkey, the most common activity in society is watching television at a rate of 85%, while 49% society never go to the cinema, 39% never read books, and 66% of people did not even attend a concert, theatre performance, and/or the opera. Furthermore, 81% of society lacks the ability to play a musical instrument, 47% never read magazines, and 86% have not participated in a hobby course. It is revealed through results that today’s
society should go through a new, comprehensive “literacy” process to change their approach to
cultural life (İKSV, 2017). In 2015, in a Global Citizenship Report covering 40 countries including
Turkey, it is shown that 70% of the Turkish respondents’ state that “actively working in the social and
political organization” is important. However, the rate of those who are members of a political party is
12%, the rate of union membership is 6% (Turkey is ranked second to last among 40 countries), and
the rate of those who are members of sports clubs, cultural or other associations and/or organizations
where they can spend their free time remains at 6% (IFCA). Through this wealth of data, it shows that
people in Turkey make limited efforts to renew themselves by participating in cultural and/or artistic
activities. This may be due to providing an environment in which individuals actively participate in
social life requires extensive mobilization of the society, ranging from structural changes to individual
efforts. Important duties range from public to civil society and from institutions to individuals with
everyone playing their part.

Today, it is seen that many educational activities conducted with Public Education Centres,
municipalities, and non-governmental organizations supported by the European Union are aimed at
making disadvantaged groups such as women and migrants competent in areas such as professional
skills and entrepreneurship as well as integrating them into the marketplace. This situation can be
described as “domestication”, where individuals are perceived as objects, not subjects (Yıldız, 2012).
Also, socialization and leisure education programs organized by some state and non-governmental
organizations reinforce women’s traditional gender roles, for example, the opening of activities such as
knitting, embroidery painting as well as mother and child education has been observed. Another
striking point is that such educational activities often include patriarchal language and hierarchical
structure. This means that from the beginning, the process, language used, and production can become
problematic for women (Taşkaya, 2017). Rowlands (1998) states that women’s empowerment can only
be possible by transforming the structure of the power relationships they experience. Thus, adult
education can be a tool to provide women with an opportunity of being the subject of their own life. In
this respect, the reasons for not attending as much as reasons for attending adult educational activities
should be examined. Individual, environmental, physical, and communication-related barriers must
also be considered. Additionally, it is important for institutions that take responsibility for female
participation and adopt educational approaches, localization processes as well as address innovative
gender equality measures in programming and implementation.

Drawing attention to the tales interpreted in a theatre event, Kuyumcu (2018) states that they
are shaped according to the needs of the feudal period from which they emerged, for example, the
rescuer, modifier and transformative roles are given to men. As in the fairy tales of “Snow White” and
“Cinderella”, good women take on the role of being beautiful and waiting passively. He also states that
women are described as skilful, flawless, and obedient types who are dependent on their homelife and
dealing with housework (Kuyumcu, 2018). In this respect, also important is what kind of theatre
education and activities women have and how they approach gender roles within these activities. It can
be argued that the works, in which the image of women is objectified and based on traditional roles,
can bring more harm than good, and lack a critical perspective. Thus, it is necessary for individual and
social development that the management and operation of all planned educational work include a
democratic structure.

Freire (1991) states that raising the consciousness of the oppressed will break the culture of
silence and fatalism, which in turn will allow the oppressed to become the subjects of their own
transformation. As a result, those who are oppressed can regain their own psychological
empowerment. Stromquist (1995) states that women become stronger in four dimensions through their
participation in adult education, including the empowerment in cognitive, economic, political, and
psychological areas. Women gain the self-confidence to understand that they are competent, deserve
better living conditions, and can act for their own benefit, which are all indicators of improved
psychological strength (Stromquist, 1995).

In the Republic of Turkey’s constitution, participatory approaches to art are stated as a general
practice that opens the way for people to participate actively in culture and the arts of society based on
the right of each individual to participate, access, and contribute to cultural life. Participatory art approaches include important educational objectives such as creating opportunities that enable people to be individuals who observe, discover, select, assemble, perceive, and express themselves. Important components to these approaches are delivering culture, art production, and services to people as much as possible as well as removing barriers to access, promoting interaction between artists and audiences by improving art education, increasing the quality and quantity of participation, paying attention to cultural diversity, and making creative expression more popular (IKSV, 2017).

In Brecht’s “epic theatre” theory, theatre art is an educational activity aimed at the participation of the audience and actors by creating a leap of consciousness within society. The pedagogical understanding proposed by Brecht is extremely valuable in terms of serving social transformation. In this pedagogical understanding, theatre has not been interpreted as a didactic method of education. Instead, it is seen as a rehearsal for the individual to think dialectically in the face of problems, to perceive the changing world, to produce learning, and to determine alternatives. Moreover, the fact that participation in a theatrical play is fun, does not in itself prevent the process of learning (Kemaloğlu, 2006; Sezgin, 2014).

After epic theatre theory, Brecht prioritized pedagogical understanding through her work coined “teaching games”. While the audience should approach with a critical eye the process of watching and participating in epic theatre, it is aimed at teaching by participation in teaching games and blurring of the lines between audience and player. Furthermore, Brecht divides the concept of pedagogy into small and large pedagogy; describing small pedagogy (epic theatre) as instances where audience distinction remains, yet the audience are no longer passive receivers and the theatre ultimately serves as the locus of the democratization for society. While large pedagogy is a place where the separation between the audience and the player is eliminated. This pedagogical understanding, which is called “teaching games”, provides a new understanding of pedagogy based on the negation of old approaches to theatre and pedagogy. The problem for Brecht is not about the theatre being educational, but instead about what and how theatre should teach (Birkiye, 2006; Kemaloglu, 2006).

After the theory of Brecht, August Boal was another artist/educator who influenced today's theatre/pedagogy world through his studies with Friere and due to similarities regarding his close relationship with pedagogy. Freire addressed literacy education in the 1970s based on participation and the humanization of the world. It calls on a process where everyone is aware of the social forces that affect him or her, and as a result, can affect change in the world. Through this process, which is called “liberation pedagogy”, the targeted freedom will only be possible through “praxis” directed towards the structures being transformed. A person who is not his master, oppressor, or oppressed is in effect an alienated person. The emancipation of people depends on getting rid of this alienation, and this can be possible through a pedagogy that enables “praxis” as well as encourages participation within a dialogue. It means facing reality, making it objective, and taking action to change it (praxis). Freire states that the great and historical duty of oppressed people is to liberate themselves and their oppressors. Four main points in his pedagogical model are remarkable:

1. The pedagogical issues covered by the process are presented as an unresolved problem with the participants, not from the top to down.
2. The solution of the problem is shaped with the learners.
3. Active actors of the process are teacher-student or student-teachers.
4. The learning process is based on the perception of the problem by objectively perceiving the problem and the discovery of solutions through experience, rather than the transfer of information as in the “banker model” (Ayhan, 1995; Vittoria, 2017).
Based on Freire's ideas, the teaching of artistic languages such as cinema, theatre, dance, and photography was recognised as part of a literacy campaign provided in both Spanish and the local indigenous language that was launched in Peru. In this campaign, Boal was responsible for the Department of Theatre Language, and developed the theory of the “theatre of the oppressed” based on the pedagogy of the oppressed through activities related to theatre language. He emphasized the Greek dithyrambos ceremonies, which are considered the basis of Boal theatre, and based on a collective and interactive form of theatre. According to Boal, in this period, the ruling class had two main interventions within theatre. In the first, theatre was transformed into a form that people could watch but not participate in, while in the second, acting was transferred to professionals who received specific training. Thus, the audience became passive consumers, who transferred their actions and abilities onto the actors. Instead, a performance in the “theatre of the oppressed” should be acted out for the audience and then be performed a second time so that the audience can become involved with the performance and work through social problems presented through play’s storyline. (Sezgin, 2013).

The concepts of participation, improvisation, and dialogue that stand out in the theories and techniques of thinkers such as Baltacıoğlu, Brecht, and Boal, match up with Freire's understanding of education. It is seen that dichotomies such as audience-actors and actors-directors become obscured within the educational practices of many forms of art. In addition, improvisations performed with the audience, in which the cathartic tradition is included, tend to increase the motivation of participants. As a result, participatory art practices based on dialogue have an important function in terms of propagating the right to art for all segments of society as well as developing a culture of democracy.

In Turkey, the number of theatre-based activities, which are performed in public places and have differing goals and utilise unique techniques continue to increase. These include creative drama, drama in education, forum theatre, process drama, imaginative theatre, dramatic play, improvisation theatre, psychodrama, art therapy, and street theatre. Play and theatre techniques are also more frequently being used in activities conducted with children, adolescents, and adults. As in many countries, in Turkey there are a variety of educational activities based on the methods and techniques of contemporary pedagogue and theatre theorists such as Brecht, Boal, Baltacıoğlu, Freire, Heathcote, Bolton, and/or Spolin. Interestingly, the social problems that are dealt with through drama studies in education are handled via life-based workshops under the axis of dialogue. Within these cultural workshops, many problems such as immigration, communication, women's rights, and the rights of children are addressed. Also, the dialogue process allows for the ideas formed in participants’ minds to be revealed as well as emphasizes the determination of models for alternative solutions to social problems.

Importantly, in participatory art it is possible to produce works of art by interacting with professional artists or solely through their own efforts at producing a product with community members (Kelly, 2014). Participatory artwork carried out with women contributes to their awareness of personal problems, allows them to express themselves more fully, and in the end increase their life satisfaction. As a result, the general aim of this current study was to determine the effect of participatory art on the life satisfaction of 14 working women from the Hopa district of Artvin province in Turkey. In Taşkaya (2017), a study carried out regarding participatory art among working women in Turkey, descriptive analysis was utilised to determine the transformative effect of participatory art. However, studies conducted in the field are quite limited when researching this topic, therefore, evaluations regarding theatre based participatory art conducted with working women are considered important in terms of setting an example for future studies and contributing to the literature.

The first meeting with the participants regarding theatre studies in the Hopa district of Artvin province was held in October 2018. The age range for the women participating in the study was between 28 to 55-years-old. The women participating in this current study came from a variety of occupations such as an accountant, cafe-restaurant operator, dentist, Pilates trainer, and a schoolteacher. Although some of the participants were experienced in social cultural activities such as
animal rights activism, women's choir, or women’s magazine, none of them had previous drama and/or theatre experience and/or education.

**METHOD**

To complete a clear and thorough assessment of working women’s level of life satisfaction due to their involvement in participatory art, the researchers in this current study utilised a case study approach. Case studies are defined as an approach used to take an in-depth look at an event, to make various explanations about the situation, and/or to develop, improve, and change the situation (Stake, 1995). In this current study, qualitative interview and participant observation techniques were used for collecting a rich data set. Interviews, which are one of the fundamental data collection tools in qualitative research, are also considered one of the most powerful methodologies used to understand others (Punch, 2014). In the data collection for this current study, answers to a semi-structured interview form which consisted of five questions were evaluated, and additional questions were also queried to obtain more in-depth opinions from participants. Prior to the interview, the purpose of this research was explained to the participants, and most of the interviews conducted as well as the studies carried out during the activities were recorded to create a video and photographic archive for analysis. Each interview regarding the participants’ life satisfaction lasted approximately 25-30 minutes, and the data obtained through these interviews were analysed through content analysis. Importantly, data that was similar were gathered into a framework that included certain concepts and themes as well as this data was organized and interpreted in a reader friendly manner (Yıldırım & Şimşek, 2011). The observations made by the researcher throughout this current research regarding the participatory theatre activities were recorded and reported.

**FINDINGS AND INTERPRETATION**

**Observation Process**

**Forming the Group and Working Process**

The idea of planning theatre education and activities for working women took shape during a period when the researcher, who has expertise in theatre and drama studies, spent time in the Hopa district of Artvin province in north eastern Turkey to provide pedagogical lessons. The first step was taken when an interview occurred between the researcher and a dentist who had been working in the district for many years, knew the region well, and was involved in the field of art. This initial participant reached out to other women in the district who might be interested in participating in theatre studies, and as a result, the first meeting with volunteers was organised on October 26th, 2018. This meeting was attended by approximately 30 people and took place in a café run by one of the later participants. At this meeting, a draft study program was created after the decision was made by some of the volunteers and the researcher to create participatory art through theatre studies education and activities.

During the second meeting held at the same location, the problem of a place where theatre performances could be carried out was determined when a wedding hall operator agreed to allow the group members to utilise the wedding hall facilities. Theatre practice was planned for every Thursday evening from 6:00 p.m. to 8:00 p.m. at the wedding hall location, which was vacant during the winter season. Also, during the second meeting, the theatre study group began focusing on how to stage a play. The researcher proposed that the group study a play titled *Confrontation*, which was written by Yeşim Eyüboğlu. The content of the play focused on women who were murdered under the auspices of honour killing. The proposal was discussed by the participatory group, and it was pointed out that when the woman is mentioned in the play, people will think about pain, murder, and sadness. As a result, the group stated they would prefer a play that was a comedy. The researcher next proposed the fairy tale of *Snow White*, which was revised to better appeal to the adult actors. Also, the revised version of *Snow White* would be staged under the name *Hopali Snow White* or *Snow White from Hopa*. In the revised version, the Princess would have grown up with a feminist mindset and cultural
elements from the Black Sea region would be incorporated into the story. The group accepted the proposal, and it was also determined that the male characters would be performed by the female actors. Again, the group met for a third time in the wedding hall, and a variety of preparations were made for the play production. For example, the script for the production was prepared and distributed, the characters for the play were discussed, and some changes were made to the actors’ wardrobes during the staging process.

**Main Characters in the Play**

For the theatre study activities and performance, the group had decided upon staging a reimagined version of *Snow White* that would encapsulate their ideas cultural values. To do so each character was envisioned to address the concerns, interests, and understanding the participants held as women as well as citizens of Turkey and the Hopa district. In the following descriptions the changes to each character are highlighted.

**Snow White:** In her relationship with the Queen, she portrays a rather naive princess portrait, but after encountering the dwarves, she draws on her feminist character and transforms the dwarves by drawing upon a character of struggle instead of solely accepting the duties of cleaning, cooking, and washing up.

**Hunter:** The hunter, who portrays one of the men loyal to the queen, yet in the reimagined play he opposes the order of the queen to kill the princess. He does so because of an ominous dream he had in the forest. The hunter becomes a character who questions the task given him and gradually begins to approach life more critically. (The participants stated it would be more correct for the hunter to have a Black Sea accent.)

**Queen:** The character is ambitious and high-minded. Seeing herself as better than others.

**Mirror:** A character who is in love with Snow White and is the queen's slave and toy.

**The Seven Dwarfs:**

**Furious:** A local type character who portrays the status quo.

**Cheery:** The most cheerful character in the fairy tale.

**Young Volkan:** A character who knows and performs Black Sea folk songs very well.

**Sullen:** He is a sullen character because he is tasked with being the reader. He will turn into a happy dwarf when Snow White has him read to the other dwarfs.

**Shy:** This character in the fairy tale has been preserved as in the original.

**Chattering:** This character in the fairy tale has been preserved as in the original.

**Dwarf:** Officer who portrays a dwarf who does not deal with or is not interested in anyone else’s business.

**Prince:** He has the role of an incompetent and funny character.

**Witch:** Although the features of this character from the fairy tales is preserved, she is drawn in a new way where she is tech savvy and uses mobile phones in her devious plots and subterfuge.

**Presenters:** It consists of two cheerful characters who convey the transitions in the play at the beginning, middle and end of the performance and do so in a slightly cynical style.
**The Story (Plot) of the Play**

The group determined how they wanted their version of *Snow White* to be and in doing so the queen in the *Snow White from Hopa* decides to get rid of Snow White whom she considers a rival as well as because of her obsession with her beauty, career, and heritage. The queen tasks the hunter with killing the princess in the woods. However, since there is no forest nearby, the hunter must take the princess to Cerattepe (a mining location). The queen also agrees that the hunter can bring the princess’s photo instead of her heart. The hunter convinces the princess to go to the forest by saying they can pick strawberries together. Later, the hunter becomes tired and after falling asleep he has a nightmare. In this nightmare, the hunter’s deceased father as well as demons and witches question the murder he is tasked to commit. When he wakes up, a conscientious accounting of what he is supposed to do consumes his thoughts, as a result, he decides against following through with killing the princess. To find a solution to his problem, the hunter takes the princess to the Borcka market in a nearby district. There they meet up with a photographer and solve the problem by using Photoshop, which is a photo editing software, to create a fake photograph of the dead princess. To convince the queen that the princess has been killed, the hunter has the photographer make photos which make it appear the princess has been killed, he then takes those photos back to the palace to show the queen. Next, animals guide the princess to the house of the seven dwarves somewhere within the forest. Meanwhile, the hunter has gone to the palace to show the queen the photos. However, the mirror accidentally gives away the secret about the trick and the queen ends up killing the hunter. She later disguises herself as a witch and goes after the princess. While Hopal Snow White is with the dwarves she tries to change things by fighting against feudal understandings. She teaches them how to cook, how to eat with good manners, how to wash their clothes and dishes as well as how to dance. She also establishes order and fairness regarding the household chores. Finally, she encourages the dwarves to develop a habit of reading books. While the dwarves are not at home the queen disguised as a witch enters the house and gives the princess a poison apple. The dwarves discover what they believe to be the dead princess laying in the forest. They become extremely upset and wail in their local laments. Later, the prince arrives on a white horse at the end of the laments being sung and the princess has awoken from her sleep. Ultimately, Hopal Snow White rejects the prince’s proposal for marriage and instead returns to the palace. The princess understands the value of her first love, the mirror, and decides to continue her life with the mirror happily ever after.

**Arrangements with Participants During the Play Staging Process**

a. A suggestion from the participant who played the hunter was to revive the hunter instead of having him killed by the queen. In doing so, punish the hunter him with a “life sentence”, which is a heavier punishment for people in the Black Sea region than being put to death. She showed the scene she had worked on including her comments and the dialogues of the actors. Following evaluation, it was decided by the group to present both the old and new versions of this scene to the audience. Thus, both versions were performed for the audiences and followed by a small explanation by the character.

b. The participant who played the angry character, in the scene where she argues with Snow White suggested that it would be more appropriate for her to rebel against Snow White instead of giving up like the other dwarfs. She showed the scene she was working with the other actors, and a tongue twister she used was highly appreciated and ultimately the scene was arranged as she wanted.

c. The participant who played the mirror character recommended that at the end of the play, when Hopal Snow White and Mirror reached to each other and were happy, they could use music from a popular Turkish movie “Selvi Boylum Al Yazmal m (My Tall Love with a Red Scarf)”’. In that popular movie, the male character (Kadir İnami) is a truck driver, and the participant proposed to go on stage with a model of a truck. She prepared her costume and truck model according to her ideas for the character.
d. The participants wanted to give their children a role in the participatory art activities. The children frequently attended theatre practices with their mothers and became interested in preparatory theatre as well as the warm-up activities. The children eventually became theatre enthusiasts and were included in the performance. Thus, the group decided to have these children play the roles of Hopal Snow White’s animal friends. Thus, the children who participated in the production gained a bit of on-stage acting experience.

e. The hunter's use of a local accent, the angry dwarf’s rhymes in a local language called Lazca, the cheery dwarf crying at the funeral ceremony in a Hemsin accent, and Young Volkan’s songs in the Georgian language were all shaped by the suggestions of participants during the practices.

f. After the group’s theatrical practice reached a certain stage, the decision was made to gain the opinions of professional theatre artists as well as benefit from their experiences. Yeşim Eyüboğlu, who writes and manages games around women's problems, and an artist, Yaşar Nezih Eyüboğlu, who has worked using the Grotovski method for many years within the Istanbul Metropolitan Municipality Theatre - Research Laboratory were both invited to Hopa. The travel expenses of the invited experts were covered by the proceeds from a pantomime show. Also, the accommodation of the visiting artists was provided through free accommodations from the participating hotel manager.

g. Workshops were held with the invited artists, and their suggestions were taken regarding topics such as having bigger roles, stage traffic, audience contact, sound and light use as well as the decor and costumes. In line with their suggestions, taking into consideration the wide corridor within the wedding hall, the dwarves’ that were going back and forth from the forest within the play, were made to go through the audience and be accompanied by cheerful songs.

h. The participants also began to organize a play called “Savaş Alanı Gibi Kadın (Woman Like a Battlefield)” for the Hopa district to be staged by a group called “Theatre Immigration” that was established by students of Artvin Coruh University. With money obtained from the organization the expenses of the Theatre Immigration group were provided for their participation in the 12th ETHOS Ankara International Theatre Festival.

i. Choosing Hopa as the geographical region included in the game, the environmental struggle and women's problems in the region were highlighted. Also, the feminist stance and combative character of Hopali Snow White as well as the many qualities of other characters such as the critical attitude of the hunter, his quest for justice, and animal rights advocacy caused the participants to embrace theatrical performance and form a great group dynamic. The participants also objected to a statement by the hunter, “I sold the mother of this world”, because they found it to be sexist, so the line was removed from the script.

j. The fact that the participants had an opportunity to realize themselves through these theatre activities and that they could convey messages to their society increased their determination to work and be successful. Also, it was observed that the close circle of the participants friends, who are aware of the theatre practices, occasionally visited and provided moral support.

k. The design and preparation of the decor was made with the cooperation of all participants. The decor was made and painted together, the costume designs were researched, and the fabrics and colours were decided upon and sewn by the participants with tailoring skills. Accessories were either purchased or collected from the outside
environment. In addition, some of the costumes and accessories such as baskets, axes, hunter's slings, and clothes, the participants preferred to use local authentic products.

l. The participants worked together to design and print poster flyers and invitations for the play, organized distribution of these items as well as gained official permits for their performance from the district governorship. Also, revenue from the sale of handmade jewellery were utilised for some expenses required to stage the performance. In addition, participants came to the theatre studies with cakes, pies, desserts, tea, and coffee, which they prepared at home or bought at their workplace. They worked in a solidarity democratic atmosphere during their group theatre activities.

m. The play was staged in the Emre Wedding Hall for 300 people on March 15, 2019, and light and technical support was provided by volunteer university students. The play, which was attended by various party members and mayor candidates, was well-received and applauded. After the play, the actors and audience participated in a dialogue to discuss the performance. During the conversation, the group expressed the district’s need for a cultural centre. Following intense demand, the Hopali Snow White play was staged on two more occasions on March 29th and April 12th, with a total of 900 attendees in all. Again, during the conversations following each staging of the play, demands for a cultural centre and animal shelter were expressed by the group members.

n. As a rule, during the plays there were no seats reserved for anyone except seats which were used by elderly audience members. This rule was not compromised for anyone including close friends and/or relatives. The play staging expenses were covered by the revenues from ticket sales. Also, with these funds a musical night was organized, and the success of the group’s performance was celebrated. Importantly, the group was able to support the treatment expenses of the stage staff member who had a heart attack during this time.

o. After the staging process of the theatrical performances, group members visited the newly elected mayor in October 2019, and requested space be allocated to continue staging these types of events. A hall was provided and the new space, which consisted of a room, a living room, and a kitchen, were transformed into a small stage with the background curtains, chairs, and technical equipment. In their new theatre space, the group began to organize rehearsals and had conversations after watching films. Another room was reserved for the play decor, actors’ costumes, and accessories. In the arrangement of the space, shopkeepers’ donations were collected and utilised to prepare the space. To continue their dialogue the participants carried out intra-group communications over WhatsApp a social media communication application. The WhatsApp online group was created in October 2018, and each member had a right to comment equally. Through WhatsApp, photos and videos of staged plays and rehearsals were shared among group members and changes to the play and text were discussed through this process.

p. Through their own effort, during the period of 2019-20 the participants showed their “poetry-drama” work consisting of dramatized poems about women’s issues and women’s struggle. The play which was staged three times in the Hopa Chamber of Commerce Hall was again staged free of charge in the nearby district of Borçka, as part of the March 8th International Women’s Day event. The income from these performances were used to support the establishment of animal shelters.

q. In this new period, movies about women in the Hopa Chamber of Commerce Hall can be seen without any fee. To improve themselves, the group also presented local events such as theatre studies and watching films at their own place. Further preparations
continue to be made for more creative drama activities to take place and the number of new members is growing.

r. The work carried out by the theatre participants attracted the attention of a national news agency from their region. Through the interviews and videos produced by the news agency, their work was shown in the local and national media.

s. It was agreed upon to change the group’s name to the "Hopa Women Theatre Group" and this name was used for their Facebook page created in March 2020. In addition, for continuity the official web site design is modelled after their Instagram and Twitter page which was created by the community group.

t. Even though it was necessary for the participatory group to stop their in-person activities due to the SARS-2, COVID-19, corona virus epidemic of 2020, they have been able to share their poems and drama via online media applications such as WhatsApp and Facebook. (Appendix 1 contains the group’s Facebook address and news stories about them.)

**Interview Results Regarding Life Satisfaction**

During the interviews, the participants were first asked to answer, “What does life satisfaction mean for you?” The responses provided, as shown in Figure 1, highlight the life satisfaction comments made by participants. For example, the participants provided responses such as quality of life, communication with the environment (family and friends), being happy with what they do in their life, peace, fulfilment of their life expectations as well as material and moral comfort.

![Figure 1. Life Satisfaction](image)

When the participants were asked whether they were satisfied about their lives, as shown in Figure 2, 29% of the participants answered yes, while 21% said partially, and 50% of participants said no.
Within the following statements information is provided to highlight the level of life satisfaction participants stated having in their lives. Direct quotes selected from three individual participants are provided in the following:

P(4): “I can say that I am satisfied with my life. Because life satisfaction is the most proper way to maintain healthy relationships with my family and friends.”

P(7): “It is not possible to be completely satisfied with life. Because I have a lot of expectations from life and I cannot say that I am satisfied until these happen.”

P(11): “I think I am satisfied with life, for me it means being happy with everything I do and experienced. I am happy with everything good and bad that I do in every environment. Because life is like that.”

When the participants were asked “What would you like to happen to increase your level of life satisfaction?” their expectations to this question were revealed through their answers. Their expectation responses are arranged under the title of expectations for increased satisfaction and provided in Figure 3.

Figure 3. Expectations for increased satisfaction

Next, the participants’ responses to the fourth question regarding “What benefit theatre work provides them?” were classified in Figure 4 as individual and social achievements.
The participants provided a variety of responses of how participatory theatre activities and studies benefited them. For example, they provided responses such as gaining self-knowledge, self-confidence, self-esteem, the pleasure of achieving and producing, positive energy, self-criticism, empathy, and responsibility. In addition, the social benefits of participatory theatre studies allowed participants to attract attention to women’s place in society, be role models for others (other women and children) and work cooperatively. It also created an environment for them to socialise and meet new people. Three direct quotes were selected from the participants responses to the question “How did theatre studies benefit you?”, and are provided in the following:

P(1): “I can count many contributions of this work for me. Most importantly, going on stage as a part of a large group, attempting and producing something both increased my self-confidence and I enjoyed the success. Being an example to the children performing with us was also extremely valuable.”

P(5): “I think it contributed a lot to the whole group, such as taking responsibility, working together, and producing something, showing everyone what women can do, and doing something nice and useful. Therefore, I believe that such studies should be increased.”

P(14): “The greatest contribution to me is that I have developed feelings such as self-confidence, self-criticism, and self-esteem. The best thing about other people was to prove to other women that women can achieve anything they want. So, I think we are doing something good not only for ourselves but also for society.”

Through the analysis of the data obtained in this current study, as shown in Figure 5, it can be stated that participation in theatre studies effected 79% of the participants’ life satisfaction in a positive way.
Participants’ responses to the fifth question regarding “How theatre studies reflect on their life?” are arranged as individual and social reflections and can be seen in Figure 6.

The participants commented on how theatre studies reflect on their life and provided statements such as the pleasure of success, personal characteristics, more time for themselves, being more confident and brave, more patient, more tolerant, and a positive reflection on their family life. The responses that the participants provided regarding their social reflections were social usefulness (making children aware of theatre and planning social responsibility projects), expressing the place of women in society, and expanding the social environment. Again, three direct quotes were selected from individual participants’ responses to this question and are as follows:

P(1): “We did these works without any financial concerns and social responsibility projects that we planned were the most important contribution to our lives. For example, helping animals in a shelter in Artvin and establishing a library in Şavşat… Our aim was to increase the widespread effect of our play (theatrical performance) in this way.”

P(2): “Since theatre works made me happy, this situation positively reflected on both my family life and work life.”
P(6): “The reflection of these works on my life is the pleasure of being able to do something as a woman who was ignored by society. I experienced a process of starting by saying I could, and now being able to say I did. It really makes people feel very good.”

P(13): “Think of women who sit in their home quietly, are drawn to their own corners and do not participate in such activities. Also, consider the women who are part of social life and work life, who work for the society, who work and produce and try to be beneficial to the society with such activities. Of course, these works have a lot of contribution to our lives.”

CONCLUSION AND SUGGESTIONS

It was revealed in the research results of this current study with 14 women participating in theatre activities in the Hopa District of Artvin province Turkey that their involvement in participatory art through theatre studies and performances greatly increased their life satisfaction (79%). In addition, the participants made several gains from their experiences in participatory theatre, both within their individual as well as their social life, and these benefits were stated by the participants to have led to an increase in their life satisfaction. It was determined from the results of this study that working women need various artwork activities to share and express their feelings and thoughts more freely as well as exchange ideas with each other and develop themselves both personally and socially. In the light of these research results, it can be said that participatory art works that have a liberal pedagogical understanding based on democratic and structure solidarity can socially empower women. Importantly, another result from the analysis of this current research showed that the culture of energy and solidarity created through involvement of group members in these participatory activities can be maintained without the support of a private and/or state institution. As a result, the research group from this participatory theatre group turned into an independent non-governmental organization that advocates women’s rights, has an increasing number of members, and continues to create new art activities.

Also, in this current study it was shown that working women find the theatrical stage as a place where they can feel more alive as well as a place where they can get to know themselves better in areas such as self-recognition and self-esteem. Through these activities, they also gained the pleasure of achieving and producing, positive energy, self-criticism, empathy, and responsibility. Furthermore, participatory theatre studies can provide women with important opportunities to break their traditional gender roles. As a result, it is particularly important for women to take part in art activities where they can convey their demands to society.

In addition, it is important that participatory art works be carried out based on liberating, democratic, and dialogue-based pedagogical ideas where participants can freely express themselves. This democratic and dialogue-based understanding should also be demonstrated in the relations, studies, and products that are staged for the community. Therefore, it should be acted within the framework of an emancipatory pedagogy, where the distinction between director, actor, and audience, which emerged in the development process of theatre art, becomes obscure and participants can also take part in expressing themselves freely. Importantly, the ideas of Brecht and Freire as well as Boal and other contemporary theatre thinkers and practitioners, who form the theatre of the oppressed, should be used as a guide for the planning and methodology of activities to be carried out in participatory theatre. In this way, the participants will be better able to express their problems, break traditional cultural patterns, create their own language, and find the courage to be free. On the other hand, the participatory artwork that is conducted with working women can also be carried out with people from various age groups and occupations such as prisoners, employees, retirees, adolescents, and immigrants.

Furthermore, in the future there is a need for more studies related to culture and the arts in which all segments of society within Turkey can participate. For example, participatory approaches and practices in the field of culture and the arts that can be utilised to mediate social transformation should be supported and expanded. Thus, the efforts of individuals and the cooperation of institutions
are needed when implementing participatory art practices. In this way, active forms of participation can be included into art programs as well as educational programs can be organized to meet the rights and needs for art among people from the surrounding region. It can also be argued that as a way of establishing future cultural policies, there is a need to revitalize the Community Centre activities that were carried out in the early Republic period of Turkey.

It has been found that in many European countries the solution to revitalizing community art activities occurs in “cultural houses”. For example, large and small institutions can provide various venues from a small room to a multifunctional centre building, which can be transformed into a community centre and/or local cultural house to be utilised for meeting the cultural needs of local citizens. It is therefore meaningful that the Hopa Municipality allocated a space for the participating group to meet, practice, and perform. In addition, participants should be encouraged to work together as a group so that they can navigate this process together with their companions rather than their activities being defined by the audience, consumer, and/or customer.

Seeing the field of culture and art as a transformative environment for its practitioners, opening the way for each participant to coexistence despite their differences, and contributing to social development and transformation are contemporary pedagogical approaches that have an important place in lifelong learning. Participatory approaches, which gain momentum when various actors come together and act together, bring positive contributions not only to the participants but also to the social life of those involved. The fact that the theatre performances in this current study garnered great interest within the small district of Hopa and reached 900 attendees, and that performances were requested by citizens from surrounding provinces and districts are all indicators that participatory theatre studies are beneficial for working women. When individuals are actively involved in artwork, they naturally become ambassadors of culture and art to others in their community. As a result, it has been seen that these activities can contribute to practitioners’ self-esteem, support the understanding of diversity, improve cooperation, facilitate solidarity, and cope with the monotony of daily life. When individuals are part of an activity where they enjoy social interaction with others in their community, they become stronger by starting to trust one another and develop a sense of belonging. Ultimately, the sustainability of such activities turns these actors into a cultural circle that enlightens the environment around them and creates an attraction for all to do more.

REFERENCES


Appendicies

The Social Media of Hopa Women Theatre Group

https://www.facebook.com/Hopa-Kad%C4%B1n-Tiyatro-Toplulu%C4%9Fu-103691181289613/

Published News Regarding Hopa Women Theatre Group

https://www.dailymotion.com/video/x7st4gf


https://www.facebook.com/SemazenKafe/photos/a.1021069027920294/2687303407963506/?type=3&theater


Evaluation of School Libraries in Terms of Quantity and Quality

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Abstract

School libraries are supplementary places enabling students to acquire reading habits and reading culture. The purpose of this study is to determine the status of libraries in schools and to take the opinions of teachers towards school libraries. For this purpose, a case study design has been utilized in the current research and observation and interview techniques have been employed. In the research, the libraries of all schools in a city centre have been observed. Through stratified purposeful sampling and criterion sampling methods, interviews were carried out with teachers working in school libraries. The research data were analysed via content analysis. As a result of the research, it was determined that two-thirds of the schools had libraries. Besides, it was revealed that the capacity of the school libraries is inadequate due to the limited physical space of the libraries in schools. Although there were computers and the internet in libraries, digitalization was determined to be limited. It was also shown that there were mostly classical works and the libraries covered inadequate number of contemporary books. When examining the genres of the books in libraries, it may be said that there were novels and story book by a majority, referring to a limited variety of genres. It has been concluded that students can not effectively use school libraries as expected due to by virtue of the limited library facilities. Accordingly, in order to ensure the effective use of school libraries by students, the physical conditions of the libraries should be improved as well as the variety and quality of the documents should be increased.

Keywords: Library, School Library, Status of School Library, Documents in School Library, Reading Culture.

DOI: 10.29329/ijpe.2022.467.15

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INTRODUCTION

Reading is, basically, the process of constructing meaning from written symbols. Having individuals acquire reading skill that begins at basic education level continues as an effort to enhance the reading skill in the upper levels of education. Books are the most important instruments in reading process. However, libraries, involving these books, are significant places to offer books to students. The presence of a variety of books in libraries facilitates students’ access to the book. Students, in general, obtain books from libraries (İşcan, Arkan and Küçükaydin, 2013; Karatay and Dilekçi, 2020a; Karatay and Dilekçi, 2020b; Majid and Tan, 2007; Tella and Akande, 2007; Zickuhr, Rainie, Purcell, Madden and Brenner, 2012). School libraries eliminate the situations that prevent the child from reaching the book. Certain obstacles as financial limitations, residing in small settlements without bookstores can be overcome thanks to the libraries (Öztürk and Tağa, 2018). Libraries are sources of information and support students’ multifaceted reading skills. Libraries are effective in gaining reading skill (Balc, Uyar and Büyükikiz, 2012; Bayram, 1990; Cevher, 2015; Clark, 2010; Dökmen, 1994; Durulap, Durualp and Çiçekoğlu, 2013; Gaona and González, 2011; Gönen, Temiz and Akbaş, 2015; Kurulgan and Çekerol, 2008; Oriogu, 2015; Wicks, 1995; Yılmaz, 2004; Zickuhr et al., 2012). School libraries are benefited to gain reading habit and acquire reading culture.

The fundamental objectives of school libraries are to have students acquire reading habit and gain lifelong learning skills and to foster their information literacy. In addition, libraries support teaching curricula by providing information sources to teachers and students. Thus, it is aimed to increase students’ academic achievements and to enable them to socialize (IFLA/ UNESCO, 2002). In parallel with the contribution of libraries to students in reading and research processes, libraries have been established in a number of schools. These libraries consist of a broad range of characteristics such as physical conditions, documents and digital supplementary elements. The capacity of libraries, the departments addressed to different purposes and the state of heating and enlightenment are required to be at an acceptable level. The appropriate physical conditions ensure that the libraries are able to provide services in accordance with their objective.

In libraries, books and documents of different quantity and quality should be included. School libraries are entailed to have at least 6000 books based on school libraries regulation (MoNE, 2006). In addition to the quantity of books in different themes, genres and levels should be included. As a matter of fact, taking into account the student characteristics, the difference in their cognition levels and their interests, there should be books for all students. Students’ book preferences are shaped by book genres, the subject, its formal characteristics and personal variables (Altunaynak, 2018; Clark and Foster, 2005; Çetinkaya, 2007; Hopper, 2005; Karatay and Dilekçi, 2020a; Karatay and Dilekçi, 2020b; Majid and Tan, 2007; Mohr, 2006; Oriogu, 2015; Rimensberger, 2014; Summers, 2013; Tella and Akande, 2007; Yaman and Süğümlü, 2020; Yurtbakan and Erdoğan, 2020; Zickuhr et al., 2012). In the light of the findings of the current research, it is quite important to ensure the diversity of books in school libraries. Furthermore, students may be interested in having audio-visual documents, entertaining and instructing materials.

Nowadays, the digitalization that has been seen every aspect of life has been started in libraries as well. There is also a transformation of libraries (Öztürk and Tağa, 2018). The libraries have not only places where books are located; instead, they are the places where computers and the internet are available. Moreover, there are smart board, e- book, digital materials and audio-visual devices. Considering the advancement in information and communication technology, these digital devices have started to be included in libraries as well. In fact, the generation studying in schools now are called as ‘digital generation’. The development of these sources depending on their interests and needs ensures the effective use of libraries.

The ultimate goal of school libraries is to help students’ access information. For this aim, students need to visit libraries, borrow books or do research in libraries. The main point is how often students benefit from the libraries. Students may need to be encouraged for the effective use of libraries. Besides, it is also crucial that teachers guide the students in younger ages. Libraries may be
required to be developed and designed for this purpose. In the current situation, it has been determined that libraries are not popular centers of interest frequently preferred by the students (Akman and Akman, 2017) and that school libraries are far from international standards (Yılmaz, 2015).

Another important issue in school libraries is by whom and how library services are provided. There is no librarian in school libraries for book sorting and book giveaways. Generally, in secondary schools, Turkish teachers are responsible for the school libraries; however, in high schools, Turkish Language and Literature teachers are responsible. When the course loads and other works are taken into account, teachers deal with the libraries in extracurricular times. Book lending and other services in the library are carried out by on-call teachers and students under the guidance of the teacher in charge of the libraries.

The Ministry of National Education (MoNE) has recently attempted to open libraries in schools and to improve the available ones in order to increase the quality of education. For this aim, a project called ‘No Schools without Libraries’ in cooperation with the Ministry of Culture and Tourism has been launched in 2021. Within the scope of this project, libraries are opened in schools that do not have libraries. In addition, book and material support are provided in other schools already having libraries. Through enriched libraries and aesthetic designs, social activity areas are created in order to like and learn information in schools. Thus, the improvement works of libraries in schools have been carried out. Indeed, in 1924, John Dewey submitted a report to the Ministry of National Education following his investigations in Turkey and stated that each school were required to have an effective library and even an area for the library were required to be planned in school construction (Dewey, 1924). As a result, it may be concluded that the policy of extending school libraries has been continued for a long time.

In the current study, with the purpose of the status of school libraries, the physical conditions of the libraries in schools, the quantity and quality of books in the libraries and the use of school libraries by the students have been investigated. In addition, certain recommendations have been made to improve school libraries. Thus, the status of school libraries has been demonstrated in all aspects.

**Research Statements**

The flowing research statements guided the present study:

1. How many schools have libraries? What is the model of school libraries? What is the size of area of school libraries?
2. What is the level of equipment of school libraries?
3. How many books and how many categories are there in school libraries?
4. What is the number of visitors of the libraries?
5. What is the year of service of school libraries?
6. What is the impact of school libraries on students’ reading skills according to teachers?
7. What are the qualifications that school libraries are required to have according to teachers?
8. What are teachers’ opinions on the books in school libraries?
9. What are teachers’ opinions on the library services in their schools?
10. What are teachers’ opinions on the students’ level of use of school libraries? What do teachers recommend for the effective use of libraries by students?
11. What do teachers recommend for the development of school libraries?

**METHODOLOGY**

In this section, information regarding research model, participants, data collection instruments and data analysis has been covered.

**Research Model**

The present research was carried out through case study, one of qualitative research methods. In case study design, the current phenomenon is investigated in its real context. The fundamental factors related to the phenomenon are examined with a holistic approach (Yıldırım and Şimşek, 2018). In this research, school libraries were addressed holistically and the current phenomenon was attempted to be revealed in all aspects. Observation and interviews techniques are frequently used in case study design. In the observation technique, the phenomenon in any medium is elicited in a detailed and comprehensive manner. However, in the interview technique, interviews are conducted with first-persons related to the phenomenon. In the present research, observations were performed according to the 20 criteria of the observation form and interviews were carried out with teachers in order to reveal the status of school libraries.

**Participants**

In this research, the libraries in all schools in the province of Bolu were investigated. The interview teachers were chosen through purposeful stratified sampling in the first stage, and then, criterion sampling technique was used. In purposeful stratified sampling, fixed number of samples from each stratum is chosen in order to represent the characteristics of certain sub-samples. Nevertheless, in criterion sampling technique, the individuals who meet certain predetermined criteria are included in the research (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz and Demirel, 2021). In the current research, on the basis of purposeful stratified sampling, seven teachers working at primary, secondary and high schools were decided to be interviewed. The teachers in the schools who were to be interviewed were determined through criterion sampling technique. The criterion for the interview is to be responsible for the library in the school. Following this sampling technique, interviews were carried out with 7 primary school teachers working at 7 different primary schools, 7 Turkish Language teachers at 7 different secondary schools and 7 Turkish Language and Literature teachers at 7 different high schools. The demographic characteristics of the participants in the research are given in Table 1.

**Table 1. Participants’ Demographic Characteristics**

<table>
<thead>
<tr>
<th>Personal Information</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
</tr>
<tr>
<td>Branch</td>
<td></td>
</tr>
<tr>
<td>Primary school teacher</td>
<td>7</td>
</tr>
<tr>
<td>Turkish language teacher</td>
<td>7</td>
</tr>
<tr>
<td>Turkish language and literature teacher</td>
<td>7</td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>17</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>4</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>21-30 years old</td>
<td>5</td>
</tr>
<tr>
<td>31-40 years old</td>
<td>10</td>
</tr>
<tr>
<td>41-50 years old</td>
<td>6</td>
</tr>
<tr>
<td>Professional Seniority</td>
<td></td>
</tr>
<tr>
<td>1-5 years</td>
<td>7</td>
</tr>
<tr>
<td>6-10 years</td>
<td>3</td>
</tr>
<tr>
<td>11-15 years</td>
<td>4</td>
</tr>
<tr>
<td>16-20 years</td>
<td>5</td>
</tr>
<tr>
<td>21 years and above</td>
<td>2</td>
</tr>
</tbody>
</table>
According to Table 1, of all the participants, 13 were female and 8 were male. Seven teachers who are primary school teachers, Turkish language teachers and Turkish language and literature teachers participated in the study. 5 of the teachers included in the study are in the 21-30 age range, 10 teachers in the 31-40 age range and 6 teachers in the 41-50 age range. 7 of the teachers have worked for 1-5 years, 3 teachers for 6-10 years, 4 teachers for 11-15 years, 5 teachers for 16-20 years and 2 teachers for 21 years and above.

**Data Collection Instruments**

In the research, data were collected through observation and interview forms. Following reviewing the related literature, 20 criteria were determined for the observation form. The opinions of 5 experts were received, and then, 11 criteria in the observation form were determined. These criteria are as follows: the presence of a library, the library model, the area size, the number of computers, the status of the internet service, the number of chairs, the number of desks, the number of books, the number of the book categories, the working hours of the library and the library’s number of daily visitors. The libraries were monitored based on the aforementioned criteria.

Following the literature review, an interview forms consisting of 6 questions were developed together with 5 experts. This form poses questions concerning the impact of school libraries on students’ reading skills, the key elements that are required to be present in libraries, the status of books, library services, use of the libraries by the students and recommendations for the development of the libraries. Through the questions addressed to the teachers, it was attempted to find out the current status of the school libraries.

**Data Collection**

In data collection process, the school libraries in the province of Bolu were observed based on the observation form. In the following, face-to-face interviews were conducted with 21 teachers responsible for their libraries at the school. The interviews were held in the physical environment of the school library. The questions in the interviews form were asked to teachers and their responses were recorded in written form.

**Data Analysis**

The research data obtained were analysed through descriptive and content analysis. Descriptive analysis was performed for the observation form. In the light of the findings gathered, the opinions of the teachers working in schools with libraries were received and content analysis was carried out. The data obtained were assessed according to the specified themes and sub-themes.

To ensure validity, the questions to be asked to the participants were determined by scanning the literature and then the observation form and the interview form was finalized after the evaluation of the two experts. The collected data were analysed as objective for the reliability of the study. To ensure the reliability of the study, two field experts evaluated the data independently of each other. According to Miles and Huberman (1994), inter-rater consistency should be above 70%. It was determined that the evaluation reliability of the experts was 90% in the present study. The situations upon which the experts disagreed were discussed again and a consensus was achieved. This result shows the reliability of the study.

**FINDINGS**

The findings of the research are presented in this section. Findings have been organised in two parts which are finding from observations and findings from interview.
Findings from Observations

The Presence of a Library in Schools, the Library Model and The Area Size of the Libraries

The schools’ status regarding the presence of a library is given in Table 2; the library models in schools are presented in Table 3 and the information about the area size of the libraries are given in Table 4.

Table 2. The Presence of a Library in Schools

<table>
<thead>
<tr>
<th>The Presence of a Library in Schools</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>20</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>Absent</td>
<td>11</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

According to Table 2, of all 31 primary schools, 20 schools have libraries although 11 do not have libraries. However, of all 27 secondary schools, 18 schools have libraries whereas 9 do not have libraries. Finally, of all 23 high schools, 19 schools have libraries while 4 do not have libraries.

Table 3. The Library Model

<table>
<thead>
<tr>
<th>The Library Model</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary Library</td>
<td>18</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Enriched Library</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3 shows that of all 20 primary school libraries, 18 libraries are ordinary libraries although 2 libraries are enriched libraries. However, of all 18 secondary school libraries, 15 libraries are ordinary libraries and 3 are enriched libraries. Finally, of all 19 high school libraries, 18 libraries are ordinary libraries whereas 1 is an enriched library.

Table 4. The Area Size of the Libraries

<table>
<thead>
<tr>
<th>m²</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-20</td>
<td>5</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>21-40</td>
<td>7</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>41-60</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>61-80</td>
<td>3</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>81-100</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>101-120</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

As seen in Table 4, the area size of the 6 school libraries are between 1-20 m²; 17 school libraries are between 21- 40 m²; 15 school libraries are 41- 60 m²; 2 school libraries are between 81-100 m² and 1 school library is between 101-120 m².

The Number of Computers, Chairs and Desks and the Status of the Internet Service in School Libraries

The information concerning the current physical situations of the libraries and digital elements is presented in Table 5, 6, 7 and 8.
Table 5. The Number of Desks in School Libraries

<table>
<thead>
<tr>
<th>The Number of Chairs</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 arasi</td>
<td>13</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>6-10 arasi</td>
<td>7</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>11-15 arasi</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

According to Table 5, 28 of all the school libraries have 1-5 desks, 27 have 6-10 desks and 2 have 11-15 desks.

Table 6. The Number of Chairs in School Libraries

<table>
<thead>
<tr>
<th>The Number of Chairs</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1-10</td>
<td>6</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11-20</td>
<td>8</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>21-30</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>31-40</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 6 shows that 9 of all the school libraries have 1-10 chairs, 24 have 11-20 chairs, 16 have 21-30 chairs and 7 have 31-40 chairs. However, 1 school library does not have chairs.

Table 7. The Number of Computers in School Libraries

<table>
<thead>
<tr>
<th>The Number of Computers</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>12</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

According to Table 7, 25 of the school libraries have 1 computer, 2 school libraries have 2 computers, 1 school library has 3 computers, 2 school libraries have 4 computers, 2 school libraries have 5 computers and 2 school libraries have 6 computers. There are no computers in 23 school libraries.

Table 8. The Status of the Internet Service in School Libraries

<table>
<thead>
<tr>
<th>The Status of the Internet Service</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>17</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

According to Table 8, 51 of all the school libraries have the internet service although there is no internet service in 6 school libraries.

The Number of Books and the Number of the Book Categories in School Libraries

Table 9 shows the number of books and Table 10 presents the information regarding the categorization of the books in school libraries.
Table 9. The Number of Books in School Libraries

<table>
<thead>
<tr>
<th>The Number of Books</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>200-500</td>
<td>7</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>501-1000</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1001-1500</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>1501-2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2001-2500</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2501-3000</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3001-3500</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3501-4000</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

As seen in Table 9, 13 of all the school libraries have 200-500 books, 9 have 501-1000 books, 17 have 1001-1500 books, 9 have 2001-2500 books, 1 has 2501-3000 books, 5 have 3001-5000 books and 3 have 3501-4000 books.

Table 10. The Number of Book Categories in School Libraries

<table>
<thead>
<tr>
<th>The Number of The Book Categories</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3-4</td>
<td>10</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>5-6</td>
<td>3</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>7-8</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>9-10</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

According to Table 10, 7 of the school libraries have 1-2 book categories, 19 have 3-4 book categories, 12 have 5-6 book categories, 14 have 7-8 book categories and 5 have 9-10 book categories.

The School Libraries’ Number of Daily Visitors

The school libraries’ status of daily visit by students is given in Table 11.

Table 11. The School Libraries’ Number of Daily Visitors

<table>
<thead>
<tr>
<th>The Number of Daily Visitors</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1-20</td>
<td>7</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>21-40</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>41-60</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>61-80</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>81-100</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 11 shows that 21 of all the school libraries have 1-20 daily visitors, 8 have 21-40 daily visitors, 15 have 41-60 daily visitors, 9 have 61-80 daily visitors and 1 has 81-100 daily visitors. However, 3 school libraries are not visited by the students.

The Duration of Daily Service of the School Libraries

The school libraries’ duration of daily service is presented in Table 12.
Table 12. The School Libraries’ Duration of Daily Service

<table>
<thead>
<tr>
<th>Duration of Daily Service</th>
<th>The Number of Primary Schools</th>
<th>The Number of Secondary Schools</th>
<th>The Number of High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1 hour</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2 hours</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>3 hours</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>4 hours</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5 hours</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6 hours</td>
<td>8</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>7 hours</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8 hours</td>
<td>0</td>
<td>0</td>
<td>14</td>
</tr>
</tbody>
</table>

As seen in Table 12, 6 of all the school libraries have 1 hour of daily service, 11 have 12 hours of daily service, 3 have 3 hours of daily service, 1 has 4 hours of daily service, 19 have 6 hours of daily service and 14 have 8 hours of daily service. Nevertheless, 3 school libraries are out of service.

Findings from Interview

The Impact of School Libraries on Students’ Reading Skills

The opinions of the teachers who participated in the study towards the impact of school libraries on students’ reading skills are given in Table 13.

Table 13. The Impact of School Libraries on Students’ Reading Skills

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Participants</th>
<th>n</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Habit and Reading Culture</td>
<td>They have a positive impact on reading skills.</td>
<td>1, 2, 3, 7, 8, 9, 10, 12, 14, 21</td>
<td>10</td>
<td>21</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>They increase the interest in reading.</td>
<td>1, 4, 6, 13, 15, 20, 21</td>
<td>7</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>They provide appropriate reading environments.</td>
<td>8, 9, 10, 14, 16</td>
<td>5</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>The library environment motivates students to read.</td>
<td>1, 3, 6, 8</td>
<td>4</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>They support having students acquire reading habit.</td>
<td>4, 11, 15</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>They promote reading culture.</td>
<td>7, 20</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>They enhance concentration on the book.</td>
<td>10</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>Access to the Book</td>
<td>They provide access to the book.</td>
<td>2, 4, 7, 8, 13, 15, 17, 18, 19</td>
<td>10</td>
<td>21</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>They provide access to various and qualified books.</td>
<td>4, 7, 11</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Academic and Social Development</td>
<td>They are social development environments.</td>
<td>8, 18</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>They promote academic achievement.</td>
<td>11</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>They arouse interest in doing research.</td>
<td>5</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
</tbody>
</table>

As shown in Table 13, teachers’ opinions have been classified as such themes as reading habit and reading culture, access to the book, academic and social development. Under these themes, the sections teachers’ opinions have been presented.

Reading Habit and Reading Culture

17 teachers participating in the study stated that school libraries enhance reading habit and reading culture among the students by saying that “I have seen that the library environment increases students’ interest in books and reading. I have realized that when students come to the library, they are more eager to read. Besides, the library provides more suitable environment for students to focus on books. In general, I think school libraries have a positive impact on their reading skills” (K1); “A well-equipped library is quite effective upon students’ reading skills” (K2); “The library environment may encourage students to read more” (K3); “School libraries are key elements in terms of improving students’ reading habits and love of reading” (K4); “Since it is a quiet environment with chairs, it
allows the child carry out an efficient reading away from external factors” (K8); “Being in a physical environment where everyone gathers for a common purpose instead of being in the usual and monotonous class environment where they spend most of their time increases the span of focus on the book and improves reading ability” (K10); “I observed that if they were directed to choose books that were appropriate for their levels, school libraries had a positive impact on reading and comprehension skills” (K11); “I think that the libraries prepared suitably for students both in terms of the content and physical environment have a positive impact on reading skills” (K12); “I think that in terms of raising students’ interest in reading and improving their reading skills, school libraries will be beneficial for students who do not have the opportunity to have a suitable environment for reading at home” (K14) and “Their desire to read is increased” (K21).

Access to the Book

11 teachers in the research said that school libraries provide access to the book by stating that “School libraries are the first places for our students who like reading books and do not have enough opportunity to meet their needs for books” (K2); “Libraries play a vital role in terms of helping students access various books at the same time. In addition, they are effective in terms of providing books to the students who do not have opportunity” (K4); “School libraries facilitates students to access books” (K9); “They provide chance for finding different books together” (K13); “The fact that students easily access the books they want and they can choose the books according to their interests is what students like” (K15) and “They facilitate poor students to access the books” (K18).

Academic and Social Development

4 teachers included in the research posited that school libraries contribute to students’ academic and social development by saying that “They provide social development as well since children read together and this contributes to children’s development in a positive way” (K8) and “School libraries are students’ first places of research, they have positive academic impacts and they promote students’ self-confidence” (K11).

The Qualifications that School Libraries are required to have

The qualifications that school libraries are required to have based on teachers’ opinions are presented in Table 14.

Table 14. The Qualifications that School Libraries are required to have

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-themes</th>
<th>Participants</th>
<th>n</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Instruments</td>
<td>It should be equipped with digital instruments.</td>
<td>1, 3, 4, 6, 8, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21</td>
<td>15</td>
<td>21</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>There should not be computers.</td>
<td>2, 5, 10</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Physical Conditions</td>
<td>The number of chairs and desks should be adequate.</td>
<td>2, 4, 7, 8, 11, 13, 16, 17, 19, 21</td>
<td>10</td>
<td>21</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>The design should be interesting.</td>
<td>1, 5, 6, 7, 9, 10, 11, 12</td>
<td>8</td>
<td>21</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>The lighting should be sufficient.</td>
<td>1, 8, 9, 12, 13</td>
<td>5</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Air-conditioning should be well done.</td>
<td>1, 8</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Workrooms should be included.</td>
<td>16, 17</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Documents</td>
<td>There should be various and qualified books.</td>
<td>2, 3, 4, 10, 14, 16, 17, 18, 20</td>
<td>9</td>
<td>21</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Appropriate books for students’ levels should be included.</td>
<td>3, 13, 14</td>
<td>4</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>They should consist of other information resources apart from books.</td>
<td>1, 3, 8, 14</td>
<td>4</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Standards of Service</td>
<td>There should be a librarian.</td>
<td>4, 16, 18</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>It should be a quite environment.</td>
<td>1, 2</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>The books should be correctly categorized.</td>
<td>1</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
</tbody>
</table>
According to Table 14, teachers’ opinions have been classified as such themes as digital devices, physical conditions, documents and standards of service. The sections teachers’ opinions have been presented under these themes.

**Digital Instruments**

18 teachers included in the research highlighted that school libraries were required to have digital instruments by saying that “There should be a projector and a projector system or a smartboard in a library; besides, tablets can also be used” (K1); “As I observed my students at the enriched library in the school where I previously worked, I am definitely in favour of the absence of digital devices in libraries” (K2); “The computers that are located in libraries to do research are also helpful in terms of doing research for students’ homework. It is especially important for those who do not have technological opportunities due to the financial difficulties” (K3); “Besides, considering the developing technology, the digital instruments addressing to various sensory organs should be used” (K8); “I think that it’s against the spirit of reading to have a digital device in a library” (K10); “School libraries should have warnings, a desktop computer (to do research and follow book give-aways)” (K11); “It should have such digital devices as computers or printers” (K12) and “School library should have a computer” (K17).

**Physical Conditions**

16 teachers who participated in the research stated that the physical conditions of school libraries were required to be appropriate by saying that “It’s also important that it should have a good lighting and air-conditioning. Besides, decorating the library in a way that draws students’ attention may encourage them to come to the library” (K1); “Physical conditions should consist of enough seats and books that are in accordance with students’ level” (K2); “There should be various genres of books, computers and seating groups, appropriate desks and chairs and workrooms” (K4); “A conveniently spacious environment. Appropriate desks and chairs. Appropriate lighting and air-conditioning” (K8); “The paint and lighting of the room should be appropriate” (K9); “There should be posters and visuals promoting the love of reading, desks and chairs suitable for children and bars on the desks so that the students are not distracted by others” (K11); “I think that physical conditions are of great importance. The layout, lighting and materials used in the libraries and the colours selected should draw students’ attention and meet their needs” (K12); “There should be individual desks and the spaces for reading and studying should be separate” (K17) and “There should be desks, chairs and other equipments” (K17).

**Documents**

13 teachers in the research noted that school libraries were required to have various and qualified documents by stating that “Because a library also needs visual resources. Students may need to watch a documentary or a film and video about the subject of the course” (K1); “There should be books that are appropriate for students’ levels” (K2); “First of all, there should be a library that will appeal to all students, where there is a number of various book types” (K3); “There should be suitable books for all age groups” (K13); “There should be appropriate books for students’ levels and, in addition, a library should also have magazines that will improve scientific creativity” (K14) and “The presence of contemporary books and the books that are appropriate for students’ ages and interests will ensure the students to come to libraries” (K15).

**Standards of Service**

5 teachers who participated in the research stated that school libraries were required to have higher standards of service by saying that “The place where the library is should be quiet. The books should be classified according to the genres” (K1); “There should be a librarian in order for students to benefit from the libraries effectively” (K4); “There should be a librarian” (K16) and “There should be an officer in a library” (K18).
The Quantity and Quality of the Books in School Libraries

Teachers’ opinions on the status of books in school libraries are presented in Table 15.

Table 15. The Status of the Books in School Libraries

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Participants</th>
<th>n</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>There is not sufficient number of qualified books.</td>
<td>2, 3, 5, 15, 16, 19, 20, 21</td>
<td>8</td>
<td>21</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>There are qualified books.</td>
<td>1, 4, 6, 10, 11, 12,</td>
<td>6</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>The books are not appropriate for students’ levels.</td>
<td>2, 9, 15</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>The books are appropriate for students’ interests and levels.</td>
<td>1, 7, 13</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Digital contents are inadequate.</td>
<td>8, 11</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>There should be periodical publications.</td>
<td>10</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>Quantity</td>
<td>The number of books is inadequate.</td>
<td>1, 2, 3, 4, 5, 8, 9, 16, 18, 19, 20, 21</td>
<td>12</td>
<td>21</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>The number of books is adequate.</td>
<td>6, 10, 11, 12</td>
<td>4</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>The books are out-dated and time-worn.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Teachers’ views on the status of books in school libraries are categorized under the themes of quantity and quality. Teachers' opinions were given under these themes.

Quality

18 teachers included in the research expressed their opinions towards the quality of books in school libraries by stating that “I think our books are in good condition in terms of quality, and selected works are of good quality and suitable for students’ levels, and the publishers are good quality” (K1); “The books do not appeal to our students in terms of quality” (K2); “Our library is quite inadequate in terms of the range of resources” (K3); “The books in our library qualified books determined by Turkish Language teachers and that will be liked by children” (K4); “The students can find most books they want” (K7); “There needs to be books that can draw students’ attention more” (K9); “I think that it’s important to have only children’s magazines and they should be periodically brought up to date” (K10); “I don’t think it meets students’ needs in terms of quality” (K12); “Books that address to each students are available” (K13); “The number of contemporary books are quite few, there are more classic ones. Apart from those, there are specific books for university students” (K15); “The books in our library are not suitable for children’s age and their developmental characteristics” (K16); “There are books recommended by MoNE” (K18); “Books from world literature are needed more” (K19) and “There is especially lack of academic resources, encyclopedias” (K20).

Quantity

16 teachers in the research expressed their opinions on the quantity of the book in school libraries by saying that “As our school and library are new, there is a lack of books in terms of quantity; we are short on the number of books” (K1); “It quite inadequate in terms of quantity” (K2); “Our school library is inadequate both in terms of the quality and quantity of the books” (K3); “It may be better in terms of quantity” (K4); “The number of the books in our school library is adequate” (K6); “The number of the books is now few and inadequate” (K8); “Many of the book in our library are worn out because they are from the past years; besides, the number of the books are inadequate because of the increasing number of students” (K9); “In my opinion, the number of the books in our school is adequate in terms of quantity” (K10); “I don’t think that the books do not meet our students’ needs in terms of quantity” (K12) and “The number of the books in our school library is limited” (K21).
School Library Services

Teachers’ opinions on school library services are given in Table 16.

Table 16. Evaluation of School Library Services

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Participants</th>
<th>n</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library Services</td>
<td>Library services are inadequate.</td>
<td>1, 3, 6, 12, 16, 17, 18, 21</td>
<td>8</td>
<td>21</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Students and teachers provide library services.</td>
<td>4, 5, 7, 17, 18</td>
<td>5</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Library services are adequate.</td>
<td>10, 11, 13</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>The capacity of the library is inadequate.</td>
<td>2, 15, 16</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>There is no relaxing environment for the student.</td>
<td>6</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>The books are getting lost.</td>
<td>17</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
</tbody>
</table>

Teachers’ opinions towards school library services have been classified under the theme of library services. The section of teachers’ views has been gathered under this theme.

Library Services

16 teachers who participated in the research stated their opinions on school library services by saying that “As our library is new, we have many shortcomings and we are trying to eliminate those shortcomings”; (K1); “We have a library that does not even have the capacity to serve for students” (K2); “In our school library, we, as Turkish Language teachers, provide services to our students; we are trying to be as effective and beneficial as we can” (K4); “It lacks an environment that provide students with comfort” (K6); “Book give- aways and control are conducted by on- call teacher and student system” (K7); “The physical conditions of the library are poor” (K9); “Primary school students, not surprisingly, spend fewer time than other students from higher levels; therefore, I find the library service adequate” (K10); “Definitely adequate. The student both who wants to do research and who wants to read a story find what he wants” (K13); “I don’t think it’s adequate; it’s neither sufficiently large physically nor has the adequate number of books addressing students’ interests and desires” (K15); “Our school library is poor because it is small and not functional” (K16) and “Students can not be provided better services because of the lack of officers” (K18).

The Use of School Libraries by Students and Recommendations towards the Effective Use of Libraries

The use of school libraries by students and teachers’ opinions towards increasing the use of libraries by students are presented in Table 17.

Table 17. The Use of School Libraries by Students

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Participants</th>
<th>n</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students’ Use Of Library</td>
<td>Students do not use the library sufficiently.</td>
<td>2, 12, 16, 20, 21</td>
<td>5</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Students are not interested in the library.</td>
<td>3, 6, 7, 12</td>
<td>4</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>The library is used in reading hours.</td>
<td>8, 10, 13, 15</td>
<td>4</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Students are interested in the library.</td>
<td>1, 8, 18</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>The majority of the students use the library.</td>
<td>4, 5, 11</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Recommendations</td>
<td>The quantity and quality of the books should be increased.</td>
<td>2, 3, 10, 12, 15, 19, 20</td>
<td>7</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td>towards Promoting</td>
<td>The libraries should always be open.</td>
<td>9, 17, 21</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>The Use of Library</td>
<td>Activities regarding books may be organized.</td>
<td>6, 8, 11</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Interesting materials should be included in the library.</td>
<td>3, 10</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>The stakeholders in the school should be collaborated.</td>
<td>5, 17</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>The teachers should encourage the students.</td>
<td>1</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Students should be trained on the use of library.</td>
<td>1</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
</tbody>
</table>
Teachers’ views on the use of libraries by students have been classified as the themes of students’ use of library and recommendations towards promoting the use of library. The sections of teachers’ opinions were presented under these themes.

### Students’ Use of Library

17 teachers participating in the research expressed their opinions on the use of library by students by stating that “The students are interested in library and the use of library is now at good level” (K1); “Unfortunately, it’s a place that our students hardly ever visit, and unless the quantity and quality of the books are increased, the same situation will continue” (K2); “Unfortunately, our library is not a frequent place for our students” (K3); “Our school library is used by a considerable group of students, we have a certain level of readers” (K4); “The use of the library in the school by our students is 1 lesson hour” (K10); “The use of library is not very effective” (K12); “For each class level, a day has been determined, that day, students use the library as a class under their teacher’s control” (K13); “It’s not effective because the library is quite crowded” (K16); “Our students and teachers who have reading habit particularly use it effectively” (K18) ; “Unfortunately, we have students who have never been to the library” (K20) and “Because the library is open at certain times, it does not reach the required level of use” (K21).

### Recommendations towards Promoting the Use of Library

15 teachers participating in the research made recommendations regarding promoting students’ use of library by stating that “Teachers need to encourage students to use the library effectively; besides, it is necessary to build a library culture” (K1); “The fact that the library is enriched in terms of the number of books and book diversity and is provided with such interesting materials as magazines and mind games may contribute students to visit the library more often” (K3); “For more effective use, there should be officers who facilitate the affairs” (K4); “A program can also be formed for children to use the library during out- of- school times” (K8); “The order of the library should be ensured and the library should be kept open all the time” (K9); “It’s important to have books suitable for students’ interests and needs for the effective use of libraries by students” (K10) and “Competitions and events can be organized with the students from the library club, and book evaluation and promotion days can be arranged ” (K11).

### Teachers’ Recommendations towards Improving School Libraries

Teachers’ opinions regarding the improvement of school libraries are given in Table 18.

#### Table 18. Recommendations towards Improving the Libraries

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Participants</th>
<th>n</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books and Other Contents</td>
<td>The quantity and quality should be improved.</td>
<td>3, 10, 11, 12, 14, 17, 19, 21</td>
<td>9</td>
<td>21</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Contemporary books should be included.</td>
<td>7, 9, 13, 15, 17, 18</td>
<td>6</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Books that are suitable for students’ levels should be included.</td>
<td>2, 3, 7, 9, 15</td>
<td>5</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Campaigns for book collecting may be arranged.</td>
<td>2, 8, 11</td>
<td>3</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Various brain teasers and puzzles should be provided.</td>
<td>10, 14</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Physical Conditions and Equipment</td>
<td>The library should be converted into a digital library.</td>
<td>1, 6, 12, 15, 18, 19</td>
<td>6</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>The design of the library should be interesting.</td>
<td>3, 5, 12, 13, 20</td>
<td>5</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>The physical conditions of the library should be improved.</td>
<td>1, 6, 9, 15</td>
<td>4</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Enriched libraries should be opened.</td>
<td>8, 17</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>There should be workrooms.</td>
<td>15</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>Library Services</td>
<td>A librarian should be appointed.</td>
<td>4, 6, 10, 17, 18, 20, 21</td>
<td>7</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Budget for libraries should be allocated.</td>
<td>2</td>
<td>1</td>
<td>21</td>
<td>5</td>
</tr>
</tbody>
</table>
Teachers’ opinions on the improvement of school libraries have been categorized under the themes of books and other contents, physical conditions and equipment and library services. The sections of teachers’ opinions have been given under these themes.

**Books and Other Contents**

15 teachers included in the research expressed their opinions concerning enhancing books and other contents in terms of quantity and quality in order to improve school libraries by saying that “It’s necessary to offer various resources opportunities to students, and I think we need to allocate resources to libraries to foster students’ screen reading skills except from their regular reading. Because people, nowadays, use the internet when they want to search about something or to read an author’s work. They read through their computers or mobile phones” (K1); “Book collection campaigns are a method that is the quickest solution as well as used by many schools, but nearly half of the books that is received by these campaigns do not appeal to students’ levels. Most importantly, those books submitted are approved by a good commission and chosen from the books that are appropriate for students’ levels” (K2); “First of all, the variety and number of the books should be increased; the library should be equipped with various materials addressing to students’ interests” (K3); “The richer the library is in terms of resources, the more efficiency can be obtained” (K8); “First of all, contemporary books that can draw students’ attention should be brought” (K9); “I recommend arranging the resources in the library be organized based on interest and need and regarding current mind games” (K10); “Book genres may be updated, the books are becoming outdated and worn out, they can be renewed” (K11); “New writers should be included” (K13); “Magazines, card games, puzzles etc. that can draw students’ attention should be present in the libraries, however, literary texts appropriate for students’ levels should be included as resources” (K15) and “It should have adequate number of books” (K21).

**Physical Conditions and Equipment**

13 teachers who participated in the research stated that the physical conditions of libraries were required to be good and the equipment to be sufficient by saying that “A well-designed library that is eye- pleasing may draw children’s attention more “ (K3); “Besides, the library to be developed should be enriched in such a way that it can appeal to visual and auditory senses at enriched library level apart from ordinary libraries” (K8); “An environment should be created where students can feel themselves more comfortable” (K9); “First of all, it should have a physical environment that can draw students’ attention and that is equipped with digital instruments” (K12); “The environment should be eyecatching” (K13); “Sufficient areas should be prepared where students can do their homework in addition to reading areas in libraries; they should be selected as the brightest and largest places in the school. Workrooms should also have computers that students may need” (K15) and “I’d like it to be like a enriched library” (K17).

**Library Services**

8 teachers in the research noted that library services should be improved by stating that “There should be a permanent staff in the library” (K4); “I recommend that the library should be kept open all the time and there should be an officer in order to improve school libraries” (K10) and “There should be an officer in the library” (K18).

**DISCUSSIONS AND CONCLUSIONS**

School libraries aim to raise individuals who are readers, researchers, information literate and life-long learners by providing them with documents required (Londsdale, 2003). A substantial body of research in the literature has revealed that school libraries made crucial contributions to students’ acquisitions of reading habit (Oztürk and Tağa, 2018). The teachers who participated in the research reported that school libraries played the important role in gaining reading habit and reading culture. Moreover, teachers noted that school libraries promoted students’ academic development and
Students frequently borrow books from libraries (İşcan, Arıkan and Küçükaydın, 2013; Karatay and Dilekçi, 2020a; Karatay and Dilekçi, 2020b; Majid and Tan, 2007; Tella and Akande, 2007; Zickuhr et al., 2012). Course programs direct students to libraries and the internet in order to conduct research. Furthermore, students are encouraged to use libraries by presenting the process of the use of a library in certain courses (Önal and Senyurt Topçu, 2013). In the current research, teachers highlighted that the most significant role of the libraries in school was to facilitate students to access to the books.

In the literature, it has been stated that there is a library in approximately one of every three schools (Yılmaz, 2015). However, existing school libraries generally do not meet expectations and do not have the desired qualifications (Şahin, 2010). As a matter of fact, it has been pointed that school libraries are not overrated and do not receive the value they deserve (Yılmaz, 2015). As a result of the observations conducted within the scope of the present research, it was determined that 57 out of 81 school had libraries whereas 24 did not. In addition, 6 out of 57 libraries were seen to be developed within enriched library model although the remaining was designed as an ordinary library. Moreover, 34 school libraries were determined to have computers whereas 23 did not have. Besides, 51 school libraries had the internet infrastructure. Teachers stated that digital instruments, physical conditions, various documents and higher standards of service were the qualifications that the school libraries were required to have. Certain digital instruments as computers and the internet should be included in libraries. Considering the physical conditions, the design should be eyecatching; the lighting and air-conditioning should be sufficient and there should be adequate number of workrooms, chairs and desks. The documents should be qualified and appropriate for students’ levels. In terms of library services, the presence of a librarian should be ensured; a quite environment should be provided and the book should be categorized correctly. The expectations of the teachers for the physical conditions of the libraries are partially met in the enriched libraries. These school libraries, which have certain standards, are used by students in accordance with their purpose and frequently (Ak & Çetintaş, 2015; Öztürk & Tağa, 2018). In addition, the assignment of a staff who performs library services will ensure that library services are carried out regularly (Ak and Çetintaş, 2015; Lance and Hofschire, 2012; Öztürk and Tağa, 2018; Scholastic, 2016). It is clear that libraries, which are physically well designed and assigned librarians, will be a supporting unit for education and training activities in the school.

School libraries are insufficient in terms of physical space (Şahin, 2010; Yılmaz, 2015). The areas that are not in the centre of the school are generally allocated to libraries. Moreover, these areas that are not interesting can be used for other purposes when needed (Yilmaz, 2015). The area size of the 6 school libraries are between 1-20 m²; 17 school libraries are between 21- 40 m²; 15 school libraries are 41- 60 m²; 2 school libraries are between 81- 100 m² and 1 school library is between 101-120 m². It may also be said that the number of chairs and desks in school libraries are not adequate depending on the number of students. Furthermore, since the capacity of the library is limited, it has been seen to be insufficient for student groups. It has been found that the use of the library by teachers and students is negatively affected when school libraries are physically inadequate (Şahin, 2010). Depending on the number of students in the school, the physical inadequacy of the libraries makes the libraries dysfunctional.

Libraries are required to have sufficient resources to read, search and learn (Doiron and Asselin, 2011; Riedler & Eryaman, 2010). The expectation of students from the libraries is to increase the number of Works (Kartal, Güner, Çelik, Soyuçoğlu and Beşer, 2019). In the current research, it was revealed that 13 of all the school libraries had 200- 500 books; 9 had 501- 1000 books; 17 had 1001- 1500 books; 9 had 2001- 2500 books; 1 had 2501- 3000 books; 5 had 3001- 5000 books and 3 had 3501- 4000 books. The majority of teachers reported that the libraries in their schools had adequate number of books although the minority of them stated that the number of books in their school libraries were not adequate. Despite the fact that most of the teachers did not complain about the number of books in the school libraries, no school library observed was able to meet the specified
standards by school libraries regulation. As a result, it may be concluded that the number of books in school libraries are inadequate. As a matter of fact, it is stated in the school standards regulation that there should be at least 10 books for each student in the library (MoNE, 2006). In previous studies, it was determined that this standard could not be reached in the number of books in the library (Öztürk & Tağa, 2018; Şahin, 2010; Yılmaz, 2015). In order to increase the number of books in school libraries, book purchases should be made periodically.

Various book types are entailed to be included in the libraries for students’ acquisitions of reading culture (Doiron and Asselin, 2011; Stranger-Johannessen, 2014). Most school libraries do not have the required information resources by contemporary education (Yılmaz, 2015). School libraries do not have resource-rich libraries (Şahin, 2010). In fact, students prefer entertaining and exciting (Trim, 2004) and adventure books (Bahar, Kaya and Bahar, 2016). Accordingly, students have asked for entertaining and engaging books to be included to a greater extent (Kartal, Güner, Çelik, Soyuçoğ and Beşer, 2019). Similarly, it was found that the variety of works in libraries was few in the present study. The documents in the libraries are mostly the books that were appropred by MoNE. It was determined that contemporary books were not present in the libraries whereas there were classical works. It was revealed that there were no different varieties of book genres and themes. On the contrary, novel and story genres are predominant among the books in the libraries. It was observed that there were no periodicals and different types in particular. While expressing their opinion on the books in their school libraries, certain teachers stated that there were not sufficiently qualified books in the libraries although the remaining noted that the books were qualified. Likewise, there are different opinions towards whether the books are appropriate for students’ interests and levels. Teachers reported that digital contents were inadequate and there was a lack of periodicals in the libraries. The main function of libraries is to contain various sources of information. However, in this study and previous studies, it has been revealed that the lack of variety of books in school libraries is a problem (Öztürk & Tağa, 2018; Şahin, 2010; Yılmaz, 2015). Increasing the quality of the books will support the libraries to fulfill the functions expected from them.

The current conditions of the libraries are far behind the international standards (Yılmaz, 2015). In the libraries in schools, there are no officers who get a bachelor’s degree in librarianship (Şahin, 2010). Almost none of the schools employ trained librarians (Yılmaz, 2015). The lack of permanent staff in the library has been found to be one of the main obstacles (Öztürk and Tağa, 2018). In line with the abovementioned studies, it was determined that there were no librarians in the schools included in the research. Therefore, library services are offered by students and teachers. It was noted that they engaged in libraries in their spare time or libraries were kept open by on-call students who were assigned daily. Correspondingly, the amount of time that school libraries are open varies. Although the majority of libraries are open during school hours, the remaining is open for 1-4 hours. Libraries offer services during breaks, lunchtime or the lesson hours when no teacher in class. In addition, it was determined that although 3 schools had libraries, they did not offer services. Besides, the books were found to be lost due to the absence of permanent staff in libraries. It may also be said that since the order and classifications are not conducted properly and correctly, the libraries are not functional and far behind facilitating accessing the book. Accordingly, it has been determined that library services were not sufficient. Students reported that they needed a quiet environment while reading in the library (Kartal, Güner, Çelik, Soyuçoğ and Beşer, 2019). A librarian may be required in order to ensure appropriate environment for reading and studying.

A considerable body of research in the literature has shown that enriched libraries in school alter students’ perceptions on the notion of library and make significant contributions to students’ being interested in libraries (Öztürk and Tağa, 2018). In the light of the findings, enriched libraries increase the rate of students’ visits to the libraries (MoNE, 2015). Similarly, the use of library has been determined to be higher in schools with enriched libraries. On the contrary, it was found that other school libraries are not frequently visited by students. Furthermore, in certain schools, libraries were not visited by students at all in the present study. Teachers, however, noted that students were not interested in libraries and did not frequently use libraries. The minority of teachers stated that school libraries were constantly visited by students. There are various factors having impact on students’ use
of library. As the reasons for the low rate of students going to the library; the inadequacy of the technology devices in the library (Öztürk & Tağa, 2018), the inadequacy of the expressions regarding the use of the library in the curriculum (Önal & Şenyurt Topçu, 2013) and the lack of book diversity (Öztürk & Tağa, 2018; Şahin, 2010; Yılmaz, 2015). Teachers emphasized that certain activities regarding books might be organized, students might be encouraged to use the libraries and taught how to use the library in order to increase their use of library.

Although school libraries are physically present, they do not offer services properly (Şahin, 2010). In the current research, teachers made recommendations towards eliminating the aforementioned problems and improving the school libraries. Teachers suggested that the books in the libraries were required to be contemporary and suitable for students’ levels. Moreover, they stated that various engaging materials might increase students’ effective use of library. To sum up, they recommended enhancing the quantity and quality of the books in the library. It is of importance that the physical conditions and equipment of libraries should be improved. Teachers pointed out that libraries might be transformed into digital libraries or enriched libraries and the design of the libraries were required to be eyecatching for the students. Furthermore, the presence of different workrooms may provide the students with appropriate environment for studying. It has been recommended that librarians should be assigned in order to maintain library services on a continous basis and based on specified standards. In addition, budgetary allocation to school libraries may ensure the libraries to eliminate the shortcomings and to have the contemporary books.

**SUGGESTIONS**

In the light of the research findings, following recommendations have been presented:

- The physical size of the libraries should be sufficient in such a way that it can meet the needs of the number of students in the school.
- The design of the libraries should be engaging.
- The number of the books in libraries should be increased.
- The quantity and quality of the books in libraries should be improved.
- Certain activities should be organized in order to increase the effective use of library by students.
- Librarians should be assigned in order to maintain library services properly.

**REFERENCES**


An Investigation of Students' Performances in Solving Different Types of Problems

Emel Çilingir Altiner
Çukurova University

Abstract

The purpose of this study was to analyze the performances of students in solving problems presented in different forms including equations, verbal equations, stories, and stories supported by diagrams in problem-solving. A descriptive survey model was employed in the study. The study group consisted of 14 fourth-grade students. Data were collected from the students by using four different types of worksheets (equation, verbal equation, story, and story + diagram). Each worksheet consisted of 10 similar problems that require the same mathematical operations but differ in presentation. To prevent the similarity in the problems by the students, the worksheets were applied to the students face-to-face by the classroom teachers during the course hours, at two-week intervals. The obtained data were analyzed through descriptive statistics. According to the findings of the study, the students solved the equation problems more accurately than the verbal and story problems. Furthermore, it was determined that students solved diagram-supported story problems more accurately than the other problem types.

Keywords: Problem-Solving, Problem Type, Equation Problems, Story Problems, Diagram Supported Problems

DOI: 10.29329/ijpe.2022.467.16

* This study has been presented at Congress of Gazi University International Turkish World Educational, on 24-26 Nov, 2021, Ankara, Turkey

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INTRODUCTION

The effects of external representations on problem-solving and learning have been discussed by many researchers (Koedinger, Alibali, & Nathan, 2008). It was observed that when a problem was presented with different external representations, it caused different problem-solving performances (e.g., the Tower of Hanoi problem). According to Logan and Ho (2013), students needed to understand the problem before starting to solve the problem. When students do not understand the problems, they have difficulty solving problems and they do not know how to represent the problem context. The use of diagrams to represent mathematical ideas is essential for elementary students to solve non-routine problems. Such operations allow students to create mental models (Pape, 2004) and organize their thoughts in connected and systematic ways (Ainsworth & Loizou, 2003). However, it is still a matter of debate how these representations or different problem presentations affect performance and learning. For example, it was observed in studies (Boonen, van Wesel, Jolles & van der Schoot, 2014) that the use of diagrams in problems increased the performance of upper-class and gifted students in problem-solving, while it did not affect the performance of younger age groups and low-talented students and even decreased their performance. However, Lowrie (2020) stated the opposite in his study. It was stated that adding diagrams to the problems also provided some variables (suitability of the diagram to the problem, student's skills, and prior knowledge, spatial chunking of information, familiarity, etc.) to increase the problem-solving performance (Koedinger, Alibali, & Nathan, 2008; Çilingir-Altner, 2018). Current research on the effects of visual representations presents a complex picture (Cooper, Sydney, & Alibali, 2018). Some studies reported beneficial effects of visual representations (Hegarty & Kozhevnikov, 1999); while others reported harmful effects (Berends & van Lieshout, 2009), or others reported no effects (Dewolf et al., 2014) or mixed effects (Magner et al., 2014). When the studies were examined, it was seen that the visual representations had different effects on the abilities of the students in the younger age groups (Berends & van Lieshout, 2009; Booth & Koedinger, 2012; Özkubat, Karabulut & Akçayır, 2020). In addition, it was revealed that the performance of students who worked with diagrams in science class was significantly better (Ainsworth & Loizou, 2003). Hembree (1992) revealed that students' success increased in problems presented with diagrams or figures. Despite all these dilemmas, NCTM (2000) advocated the use of diagrams in mathematics education. Because diagrams can support students' mathematical problem-solving performance by emphasizing relevant spatial information that was not easily accessible from the text or by making critical information more specific (Davenport et al., 2008). When diagrams were more interesting (e.g., colouring), students would bring more information into the learning environment for active processing (Mayer, 1993). However, drawings containing no relevant mathematical information, such as a drawing of a person's face, may not support learning or problem-solving at all. So the type of diagrams was also important for problem-solving.

When other studies on problem types were examined, there were also studies, showing that students have more difficulty in verbal story problems than that in equation problems (Sloutsky, Kaminski, & Heckler, 2005). In these studies, it was stated that students should be directed to verbal story problems after gaining experience in equation problems. The inability to translate story problems into usable internal representations or to produce appropriate mathematical representations of the problem can hinder successful problem-solving. However, in some studies, it was stated that students should be directed to more abstract equation problems after gaining experience in story problems (Koedinger & Nathan, 2004). According to the researchers, there were no clues such as which operation to do and in what order due to the lack of words and syntax in equation problems.

The preferred strategy to enable students to learn in the elementary school period was to make a smooth transition to soft information by using concrete information. In addition to gaining concrete experience, students were provided gain experience with real-life examples (stories), so that they can use more abstract representations by using these connections and transfer their knowledge to different environments more easily. Foong and Koay (1997), in a study on the types of problems teachers use, stated that when determining mathematical problem types, teachers generally used word problems found in textbooks. The content of the textbooks taught in Turkey and the types of problems used are very important. Because teachers give priority to the use of sample problem types in textbooks. For
this reason, the types of problems that teachers use constitute the types of problems that students will encounter more. In this direction, when the Ministry of National Education Mathematics Teaching Program (2018) was examined, one of the aims of the program was to establish a connection in mathematics teaching: It enabled students to make sense of mathematical ideas by realizing the relationships between concrete experiences, mathematical language, visual elements (diagram, schema, graph, number line, etc.) and mathematical symbols (0, 1, 2, +, =, etc.). In the program, it was emphasized that the relationship established between different mathematical ideas, concepts, and skills were very important in the development of students’ conceptual understanding. In the first stage of the relationship-building process, students should be invited to make sense of what they were doing to solve mathematical problems. For these purposes, primary school books and lesson plans were arranged and primary school students received their education in this direction. It was also a matter of curiosity about what kind of problems primary school students solve better by using the newly adopted teaching approach. However, it was determined that studies on different types of problems were limited in the primary school period, where many efforts were made to increase problem-solving performance (Lowrie, 2020). To fill this gap, the problem-solving performances of students in solving problems such as equations, verbal equations, stories, and stories supported by diagrams in problem-solving were tried to be determined.

**METHOD**

The descriptive survey design was used in the research. Descriptive studies allow us to describe a given situation as precisely and carefully as possible (Büyüköztürk et al., 2011). It aimed to describe, compare, classify and analyze the parts that make up the event to reveal what it is (Cohen, Manion & Morrison, 2000).

**Participants Research Design**

In the 2020-2021 academic year, 14 students (9 girls and 5 boys) in two different classes, studying in the fourth grade, participated in the research. The application of research was carried out in a public elementary school located in the inner region of Turkey. The participants of the research were selected through easily accessible sampling. The reason for choosing this method was to apply face-to-face with students who come to school during the epidemic period. For this reason, students who came to the school and whose parent consent forms were obtained were included in the study.

Before starting the study, the required permissions from the teacher and the school principal were obtained and the consent forms of the parents were collected from the parents. Data were collected in accordance with the necessary ethics.

**Data Collection**

Using the questions used by Booth and Koedinger (2012) and the Mathematical Operations Test of Suwarsono (1982) with visual solutions, worksheets belonging to 4 different problem types (equation, verbal equation, story, and story + diagram) were prepared. While preparing these worksheets and choosing the problems, compliance with the level of the students was taken into consideration. Expert opinions were obtained from 2 mathematics education specialists and 3 classroom teachers. The opinions collected from the teachers were evaluated with the Lawshe analysis. Content validity ratios (CVR) were determined by using the data obtained from the experts. The CVR values of these questions were 0.6 and above. Arrangements have been made regarding the questions and procedures that are required to be corrected. After these questions were corrected, the score was accepted as 1.

Each worksheet consisted of 10 similar questions that require the same mathematical operations but have a different presentation. For the students not to notice the similarity in these problems, the worksheets were applied to the students face-to-face by the classroom teachers during the course hours, with an interval of 2 weeks. Table 1 shows examples of different types of problems.
<table>
<thead>
<tr>
<th>Equation</th>
<th>Verbal Equation</th>
<th>Story</th>
<th>Story + Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>((-15) / 3 = 20)</td>
<td>If we subtract 10 from which number and divide by 4, the result is 10?</td>
<td>My aunt set aside 150 ₺ from her salary and distributed the rest equally to each of her 3 daughters. If each girl received 30 ₺, how much is my aunt's salary?</td>
<td>My mom won some money in the lottery. She allocated 15 ₺ to herself and distributed the remainder equally to each of her 3 sons. If each son received 20 ₺, how much did my mother earn? (You can use the image below to help you solve the problem.)</td>
</tr>
<tr>
<td>(___ = ?)</td>
<td>so</td>
<td></td>
<td>Money that the mother distributes equally to her children</td>
</tr>
<tr>
<td>(x 2 = ___ + 1)</td>
<td>Which number is equal to the sum of one half of itself?</td>
<td>There is 1kg weight and half a watermelon on one pan of the scale. In the other pan, there is a whole watermelon. If the scales are in balance, how many kilograms does a watermelon weigh?</td>
<td>There is 1kg weight and half tile on one pan of the scale. On the other side, there is a whole tile. If the scales are in balance, how many kilograms does a tile weigh?</td>
</tr>
<tr>
<td>(___ = ?)</td>
<td>so</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(50 x 3 = ?)</td>
<td>What is 4 times the number 60?</td>
<td>Ali completes part of his journey by plane and the rest by bus. The distance travelled by bus is half the distance travelled by plane. If the distance travelled by plane is 50 km longer than the distance travelled by bus, how many kilometres did Ali travel in total?</td>
<td>A tourist completes part of his trip by plane and the rest by bus. The distance travelled by bus is half the distance travelled by plane. If the distance travelled by plane is 50 km longer than the distance travelled by bus, how many kilometres did the tourist travel in total?</td>
</tr>
</tbody>
</table>

| Table 1. Problem Types |
Analysis Of Data

The data obtained were then analyzed using descriptive statistics. The following questions were examined: (1) How were the students' answers according to the types of problems? (2) Which type of problem has more truth? (3) Which types of problems were answered correctly when being asked?

Since the number of male and female students was not close to each other, the number of correct answers according to the problem types of male and female students was not considered.

FINDINGS/RESULTS

It was tried to determine the problem-solving performances of the students in the solution of the typical problems like equations, verbal equations, stories, and stories supported by diagrams, and first of all, the answers given by the students to different types of problems were examined. Table 2 lists examples of the answers given by the students.

Table 2. Correct and Incorrect Answers to Different Types of Problems

<table>
<thead>
<tr>
<th>Problem Types</th>
<th>Correct Answer</th>
<th>Incorrect Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation</td>
<td>8. $4 \times 6 = 24$ i.e. $4 \times 7 = ?$</td>
<td>8. $4 \times 6 = 24$ i.e. $21 \times 7 = ?$</td>
</tr>
</tbody>
</table>

When the correct and incorrect answers given by the students to different types of problems were examined in Table 2, it was thought that the reason for the wrong answer in the equation problem was due to the lack of explanation in the problem. In the verbal equation problem, the student both made a calculation error and could not engage the reasoning process. For example, a number multiplied by 6 is 24, and she/he cannot reason about whether this number will give the same result when multiplied by 7. It was noteworthy that the correct answer to the story problem was shown with a diagram. It was seen that the wrong answer was given incorrectly due to not fully understanding the question or not reading the question completely. In the story problem supported with a diagram, although the student used the diagram presented to her/him in the correct answer, it was observed that the student who answered incorrectly used the diagram incorrectly and put the numbers in the wrong
place. Table 3 lists the scores that the students got from the worksheets in different problem types and also the number of correct answers.

**Table 3. The Scores Students Obtained from Different Types of Worksheets**

<table>
<thead>
<tr>
<th>Student</th>
<th>Gender</th>
<th>Equation</th>
<th>Verbal Equation</th>
<th>Story</th>
<th>Story + Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Female</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>S2</td>
<td>Female</td>
<td>10</td>
<td>8</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>S3</td>
<td>Female</td>
<td>7</td>
<td>6</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>S4</td>
<td>Male</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>S5</td>
<td>Female</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>S6</td>
<td>Female</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>S7</td>
<td>Male</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>S8</td>
<td>Female</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>S9</td>
<td>Male</td>
<td>8</td>
<td>10</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>S10</td>
<td>Male</td>
<td>8</td>
<td>7</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>S11</td>
<td>Female</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>S12</td>
<td>Female</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>S13</td>
<td>Female</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>S14</td>
<td>Male</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

When Table 3 was examined, it was seen that students obtained different scores according to different types of problems. While some students (for example, S14) got high scores (N=8) from equation problems, they had no correct answers to story problems. While S7 got high points (N=9) for story problems supported with diagrams, he got lower points (N=3) for story problems compared to other problem types. S5, S8, S12 got similar scores in almost all problem types (for example, student coded S8: Nequation = 9, Nverbal equation = 9, NStory = 8, NStory+diagram = 9). The number of correct answers given by the students to different types of each problem is given in Table 4.

**Table 4. Correct Answers to Different Kinds of Problems**

<table>
<thead>
<tr>
<th>Problems</th>
<th>Equation</th>
<th>Verbal Equation</th>
<th>Story</th>
<th>Story + Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>10</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>13</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>10</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>13</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>5</td>
<td>9</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td>98</td>
<td>98</td>
<td>115</td>
</tr>
</tbody>
</table>

According to Table 4, it were 104 in the equation type, 98 in the verbal equation type, 98 in the story type, and 115 in the diagram-supported story type answered the question correctly. Students solved equation problems more accurately than that verbal and story problems. At the same time, it was seen that students solved diagram-supported story problems more accurately than other problem types.

**DISCUSSION, CONCLUSION AND IMPLICATIONS**

When the answers given by the students were examined, it was thought that the reason for giving the incorrect answer to the problem was that the student did not understand the problem in general. According to Logan and Ho (2013), students tended to assign arithmetic operations to embedded quantities while solving problems in an incomprehensible problems. This situation can be understood from the fact that the student should not use a number in the equation problem, but use the given all numbers or pieces of information, for the solution of the problem. Similarly, as a result of not fully understanding the verbal equation problem, it was seen that the students make conceptual errors
as well as procedural errors. In the story problem, although the problem was based on the knowledge of concrete quantitative relations and what to do in the problem was explained in detail, it was thought that the student may have solved the problem incorrectly as she/he wanted to solve the problem quickly, read the problem quickly and take action immediately. As such, it can be said that the student did not understand the problem. Booth and Koedinger (2012) stated in their study that diagrams were useful additions to story problems for more successful students and that their use as a transition to abstract, symbolic representations can be constructive for these students. In their study, they examined the performances of 6th, 7th and 8th-grade students in diagram-supported story problems. They found that students with low math skills did not benefit from diagrams. As students’ capacity increases, they can better coordinate the diagrams and information in the problem sentence and make more accurate decisions about where to focus on the problem. There are also studies, which indicate that success in diagram problems was associated with increased working memory capacity (Lee, Ng & Ng, 2009). It should be noted that a representation can only be useful to the extent that it was “understood” by the child (Dufour-Janvier, Bednarz & Belanger, 1987). The reason for the differences in the performance of the students in this study may be due to the fact that the students have different mathematical skills.

In the study, it was seen that equation problems using procedural information were solved more accurately than that the verbal equations and story problems using conceptual information. When the studies comparing the solutions of equation problems and story problems were examined, it was obvious that although middle school students (6, 7 and 8th grades) solve story problems better than equation problems (Booth & Koedinger, 2012), the opposite was true for university students (Koedinger, Alibali, & Nathan, 2008), university students solved equation problems more easily. This may be due to the fact that elementary school students' procedural knowledge skills develop earlier than conceptual knowledge. Students were more familiar with calculation. Reading comprehension in verbal problems was a skill that can be developed in the elementary school period (Akay, 2004). It was thought that students' performance in verbal equation problems will also increase with the interdisciplinary teachings related to reading comprehension and the diversity of problem types preferred by the teacher.

Another finding was that students were more successful in equation problems than in verbal equation problems. However, in some studies, on the contrary, it was stated that students who started elementary school were more successful in verbal problems rather than symbolic equation problems (Carpenter & Moser, 1984; De Corte & Verschaffel, 1981). Therefore, the result obtained was not supported by previous studies. It can be said that current mathematics education programs in elementary school affected the student's performance in problem-solving according to the types of problems.

In this study, fourth-grade students solved story problems by using diagrams more accurately. Thanks to diagrams, students were guided to visually distinguish the components of the problem rather than distinguishing them from words. This suggested that the problem can be solved more easily because it makes it more concrete. Unlike Booth and Koedinger's (2012) study, sixth grade students tended to solve more problems in the story type correctly, while seventh and eighth grade students solved more problems correctly when a diagram accompanied the story. They argued that factors such as mathematical skills, familiarity with problems, and experience are effective in this. However, by changing the understanding of the mathematics curriculum and textbooks in Turkey (see 2005 curriculum, 2015 curriculum and 2018 curriculum), including more visual elements in these materials and supporting the problems with visual elements have increased the familiarity, skills and experience of elementary school students with diagram-supported story problems. For this reason, it was ensured that the skill of using the diagram was reduced to the lower classes. Because the special aims of the Ministry of National Education Mathematics Curriculum (2018) include developing mathematical literacy skills, understanding mathematical concepts, using mathematical terminology correctly, expressing one's own and others' reasoning, developing metacognitive knowledge and skills, being able to use the skills of estimation and mental processing effectively, expressing concepts with different forms of representation, and making sense of the relationship between people and objects. This explains why and how elementary school students acquire the ability to use diagrams.
In this study, unlike other studies, both elementary school students were studied and in terms of the diversity of different problem types, some more extensive information was provided about the diagrammatic, symbolic, verbal and story problem types of the students. In addition, when previous studies were examined, it was seen that considering individual differences in ability and attitude was important for understanding the effects of different types of representations on problem-solving (Cooper, Sidney & Alibali, 2017). Future studies could benefit from further investigation of the effectiveness of these different types of problems in a larger sample. In addition, the fact that the study was only descriptive prevented generalizations from being made. It is considered important that future studies can generalize the results by using different analysis methods.

REFERENCES


Determining the Changes in the Cognitive Structures of Ecology-Based Natural Education Participants through the Word Association*

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Abstract

This study aims to determine the changes in the cognitive structures of the 35 participants after ecology-based nature education in Bursa Uludag and its vicinity. This study used a single group pretest-posttest experimental mode where the data was collected by a word association test. It included the key concepts of nature, national parks, biodiversity, ecosystem, and environmental problems. The analyzed data determined that ecology-based nature education strengthened the cognitive structures of the participants regarding the key concepts. It was also concluded that the participant’s awareness of the destruction of nature and the importance of nature protection had increased. The research results show that such education programs, providing one-to-one interaction with nature, help participants to understand nature and natural holistic cycles correctly, thus encouraging its protection.

Keywords: Nature Education, Teacher, Cognitive Structure

DOI: 10.29329/ijpe.2022.467.17

* This project was supported by TÜBİTAK Science and Society Projects Support Program “4004 Schools of Nature Education and Science” [Project Code: 117B020]

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INTRODUCTION

Nowadays, only using technology and operating various protocols and laws to solve rapidly increasing environmental problems is insufficient (Tilbury, 1995). Environmental awareness, environmental ethics, correct value judgments, positive attitude toward nature, interest, sensitivity, awareness, and sense of responsibility in individuals are significant for environment and nature education (Çepel, 2006; Genc, Genc & Goc Rasgele, 2018; Tilbury, 1995; UNESCO-UNEP, 1977). However, environmental and nature education should include schools and their environment, and also be supported by outdoor education environments.

Outdoor education environments are considered complementary to school education and training processes (Weiss, Coffman, Post, Bouffard, & Little, 2005). It includes schoolyards, science centers, museums, planetariums, aquariums, zoos, botanical gardens, and natural environments (Bell, Lewenstein, Shouse, & Feder, 2009). It has been frequently discussed that such environments might aid education (Gerber, Cavallo, & Marek, 2001; Tatar & Bağryanik, 2012; Morentin & Guisasola, 2015; Bakioğlu & Karamustafaoğlu, 2017; Hansen & Sandberg, 2019; Thomas, 2018; Thomas et al., 2019; Cure, Hill, & Cruickshank, 2018). Previous research shows that outdoor education environments positively affect education (Bamberger & Tal, 2008; Morag & Tal, 2012; Sturm & Bogner, 2010; Balçın & Yavuz Topaloğlu, 2018; Demircioğlu & Aslan, 2018; Gürsoy, 2018).

Environmental education in outdoor education environments helps students to hear, see, and touch, which is limited in classrooms. Outdoor education also makes students more sensitive and conscious, inspiring independent thinking by interacting with nature. Therefore, teaching ecological subjects and concepts in outdoor education environments helps develop correct value judgments and relationships with nature. It inspires their responsible behavior (Pfundt & Duit, 2002; Özkan, Tekkaya, & Geban, 2004).

Environmental education changes individual knowledge, attitude, and behavior using different approaches for this purpose (Tidball & Krasny, 2011). One of them, helping effective environmental education, is nature-based learning (Chawla, 2018; Genc, Genc & Goc Rasgele, 2018). Nature-based learning is an educational approach where the natural environment becomes a learning environment and individuals learn directly related to nature. It encompasses informal learning like playing and exploring natural areas. Individuals learn through informal programs created in nature centers and parks, and formal training where participants go to planned out-of-class or natural areas (Chawla, 2018). Accordingly, nature education can be evaluated regarding nature-based education.

Nature education offers the real-world equivalent of knowledge through field trips and practical activities (Erentay & Erdoğan, 2012). These training in natural areas help participants become a partner of nature, where they interact directly and perceive its different dimensions (NAAEE, 2010; Palmerg & Kuru, 2000). However, it is important to prepare an environment in nature education to realize. Individuals, here, perceive natural environments as laboratories and learn by discussing and questioning them. Thus, it supports a holistic understanding of nature by observing, practicing, and questioning.

In Turkey, the environmental, natural, and ecological concepts associated with them are studied in almost every grade level, beginning from primary school. It places them in various courses like Life Science, Social Studies, Science, Biology, and Geography with an interdisciplinary understanding (Aknoğlu & Sarı, 2009; Çağlar & Karapınar, 2017). Studies show that nature education is confined to certain courses and units (Sadık & Çakan, 2010; Köse et al., 2011). Confining nature education to formal education within the classroom is the biggest obstacle to cognitive and affective development, practice, and alternative solution approaches (Wilson, 2008; Bilton, 2010; Özerbaş, 2011). Effective nature education can be achieved by implementing “in-school” and “out-of-school” programs in a supportive or complementary manner. The current scientific research, and the 4004-Nature Education and Science Schools Projects, which is a sub-program of the Scientific and Technological Research Council of Turkey’s [TUBITAK] Science and Society Projects, are
significantly practiced to address this deficit. Among these projects supported by TUBITAK, activities in an out-of-classroom environment are crucial (Akay, 2013).

Similar educational projects share ecology-based scientific data with the majority of society and increase their effectiveness in life. They have been implemented in developed countries like the United States of America, Canada, England, and Japan since the 1990s (Hale & Golley, 1995). It was the first time in Turkey’s national parks, that an ecology-based nature education project was launched by coordinating with TUBITAK in 1999 in Thermessos (Güllük Mountain) National Park. It has increased since that time daily. Today, 85 projects under the 4004 Nature Education and Science Schools 2018/2 Call Period continue through TUBITAK’s support and the participation of competent trainers.

Natural areas as fields of education and training are significantly important to developing environmental awareness, sensitivity, consciousness, interest toward nature, correct attitudes, and behavior. Positive changes occur in the environmental sensitivity and behaviors of the participants due to education based on nature experience (Palmberg & Kuru, 2000; Coyle, 2010; Ajiboye & Olatundun, 2010; Karpudewan et al., 2015). Many studies state that such applied trainings affect the attitudes and knowledge of the participants (Bogner, 1998; Gülaly Ogelman, Önder, Durkan & Erol, 2015; Gülaly Ogelman & Durkan, 2014; Keleş, Uzun & Varnac Uzun, 2010; Balkan Kıyıcı, Atabek Yiğit & Seleen Daçın, 2014). We also see that nature training mostly satisfies the participants’ expectations and their ecological perspectives change (Meydan, Bozyiğit & Karakut, 2012). When considering these positive contributions, it becomes beneficial to engage with the wider masses of nature education with the help of educators from different specializations. Research on the training effectiveness will also support the development of subsequent training to become more efficient. The public sees national parks and natural protected areas in Turkey as mere rest and pastime places. However, these areas are suitable for ecology-based scientific education and ecotourism activities with the necessary infrastructure. The open approach to nature education and ecotourism activities in national parks is important to not exceed the bandwidth of those parks (Keleş, Uzun & Varnac Uzun, 2010). This way, these areas fulfill their purpose, and society will realize the importance of protecting them with this training.

We see, by examining the studies in this field, that it is primarily studied with primary and secondary school students (Akay, 2013; Avcı, Özenir, Kurt & Atik, 2015; Bogner, 1998; Bogner, 2010; Palmberg & Kuru, 2000; Genc, Genc & Goc Rasgele, 2018; Gülaly Ogelman, Önder, Durkan & Erol, 2015; Kossack & Bogner, 2012; Leong, Fischer & McClure, 2014; Ök, 2016; Özdemir, 2010). There are also fewer studies with teachers (Balkan Kıyıcı, Atabek Yiğit & Daçın, 2014; Gülery, 2009; Keleş, Uzun & Varnac, 2010; Meydan, 2012; Singh, 2011). Teachers help children develop and improve their environmental knowledge and awareness by encouraging their natural curiosity and interest. However, an eco-friendly teacher can effectively provide students with environmental information (Doğan, 2007; Haktanır, 2007; Keleş, Uzun & Varnac Uzun, 2010; Lewin-Benham, 2006; Malone & Tranter, 2003; Phenice & Griffore, 2003). Currently, the literacy levels of teachers, prospective teachers, and academically related people are vital. However, when studies are examined, we see that teachers and prospective teachers’ levels of environmental literacy is inadequate (Diekmann & Peter, 1998; Jordan, 2008; Kıșoğlu, 2009; Kibert, 2000; Kuhlmeier, Huub & Nijs, 1999; Seving, Kıyıcı, Altaş & Alınoz, 2008; Tuncer, Tekkaya, Sungur, Çakıroğlu & Şahin, 2008).

In Turkey, the environmental and natural concepts are positioned in various courses as an inter-disciplinary approach. The studies performed to increase the knowledge and awareness of teachers of all levels and different branches about nature are also gaining importance. This kind of nature education helps teachers and prospective teachers to obtain multi-faceted information. The opinions about environmental protection may change positively, and they may even share their knowledge and experiences with the students and those around them. They also may feel responsible for raising environmental awareness. This will influence prospective teachers participating in nature education to develop a positive perception and awareness of nature. When they become teachers, they will communicate these positive feelings and thoughts to their students.
It is also an inevitable fact that to raise environmentally conscious individuals, we need teachers who take preventive measures before the issues escalate, set examples for their students, and are educators from different professions. Thus, environmentally literate teachers having this awareness should be trained. (Balkan-Kyrcı, Atabek-Yiğit & Darçın, 2014). We think that this study will contribute to the field in this context. This study aims to determine the change in the cognitive structures of the ecology-based nature education participants related to nature, national parks, biodiversity, ecosystem, and the participants’ environmental problems through a word association test.

METHODOLOGY OF RESEARCH

General Background of Research:

This study was performed under a 10-day training project called “Ecology Based Nature Education VI (EBNE) in Uludag National Park in Bursa and its surroundings”. It was supported by TUBITAK-4004 Nature Education and Science Schools Program. This study was considered an experimental study since it aimed to determine the effect of the training on the participants’ cognitive structures. In experimental studies, the effect of the independent variable, created by the researchers, on the dependent variable is determined and cause-effect relationships are revealed (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz & Demirel, 2020; Christensen, Johnson & Turner, 2020). This study used one group pretest-posttest experimental model. Intervention is performed between pretest and posttest measurements in this model (Christensen, Johnson & Turner, 2020).

Sample of Research:

The study group included 35 participants from 185 individuals who applied to EBNE. The first criterion to determine the participants was their personal information requested during the practice, their reasons for participating in the training, the associations containing membership, and information regarding fields of special interest and occupation. It even involved a written text, explaining their reason for participating in the project in at least 100 words. The completed forms from all applicants were examined. The candidates whose project participation overlapped with its purpose were chosen. The study included 24 (68.6%) teachers, 6 (17.1%) graduates and doctorate students working in education, 1 (2.9%) research assistant, 1 (2.9%) volunteer from non-governmental organizations, and 3 (8.5%) public personnel from rural areas, total 35 people.

Procedures and Instrument:

The activities performed under EBNE, including both theoretical and practical studies, and observation and field studies, are presented in Table 1. The scope of the project involves a total of 10 faculty members, consisting of experts from various branches, who participated in the project as instructors. Each instructor congregated with the participants on their specified day and trained them in their area of expertise. They evaluated the training with the participants by sharing the study in the evening.
Table 1. EBNE Program

<table>
<thead>
<tr>
<th>Day</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Biological and ecological concepts and nature education</td>
</tr>
<tr>
<td></td>
<td>Nature sports and first aid</td>
</tr>
<tr>
<td></td>
<td>The relationship between folk culture and nature</td>
</tr>
<tr>
<td>2</td>
<td>Flora and fauna of Uludağ</td>
</tr>
<tr>
<td></td>
<td>Plant and animal collection and storage techniques</td>
</tr>
<tr>
<td></td>
<td>Uludağ’s lichen and fungi</td>
</tr>
<tr>
<td>3</td>
<td>Practice and observation trip on fauna and flora of Çobankaya-Saralan and Alpine Regions</td>
</tr>
<tr>
<td></td>
<td>Night walk and observation of nocturnal animals in Uludağ</td>
</tr>
<tr>
<td>4</td>
<td>Geomorphological observation trip in Uludağ and Uludağ Lakes Region</td>
</tr>
<tr>
<td>5</td>
<td>Geomorphological investigations in Aras Waterfall, Barkal Pond, Keles, and Kocayayla; study trip on soil organisms and forest vegetation Uludag University Zoological Museum visit</td>
</tr>
<tr>
<td>6</td>
<td>Fauna and flora observations at Uluabat Lake, Mustafa Kemal Paşa, and Suuçtu Waterfalls, Observation of environmental pollution around Uluabat Lake and discussions about solution proposals</td>
</tr>
<tr>
<td>7</td>
<td>Investigation of the lake ecosystem and soil formation and varieties in and around İznik Lake</td>
</tr>
<tr>
<td></td>
<td>Discussion on the place and importance of documentaries in nature education</td>
</tr>
<tr>
<td></td>
<td>Documentary screening about Uludağ</td>
</tr>
<tr>
<td>8</td>
<td>Investigation of the pressure of the settlement areas on nature in Cumalikızık</td>
</tr>
<tr>
<td></td>
<td>Investigation of river systems and fauna in Saitabad and Kürekli Waterfalls</td>
</tr>
<tr>
<td></td>
<td>National parks legislation and compliance with nature tourism</td>
</tr>
<tr>
<td>9</td>
<td>Investigation of cave fauna in İnegöl, Hilmiye Village, and Oylat Cave and discussion of pollution in the region</td>
</tr>
<tr>
<td>10</td>
<td>Importance of nature education in creating environmental awareness</td>
</tr>
<tr>
<td></td>
<td>Ethics of respect for life and nature in ecology</td>
</tr>
</tbody>
</table>

The change in the participants’ cognitive structure after EBNE was determined by a word association test (WAT). WAT is a technique that determines the cognitive structure of individuals, cognitive structural changes, and misconceptions to analyze the relationships between concepts in this structure (Bahar & Özatlı, 2003; Cardellini & Bahar, 2000; Hovardas & Korfiatis, 2006, Özata Yücel & Özkan, 2018). During the WAT, the participants provide one or two-word responses to the key concept (stimulus words) that they recall over time. The number of responses given to a key concept and their nature indicates the understanding of that key concept. The speed of the answers given to the key concept is directly proportional to the relatability of that response to the key concepts (Bahar & Özatlı, 2003; Tsai & Huang, 2002; Shevelson, 1974). The sentences formed after the WAT determines the relationship established between the key concepts and their responses, and they can also help evaluate cognitive and affective relationships (Gunston, 1980).

This study uses WAT for participants before and after the practice as pretest and posttest. Nature, national parks, ecosystems, environmental problems, and biodiversity are considered key concepts. It is related to the project’s purpose and the content and considers the expert opinions. The participants wrote down the first ten answers to the key concepts, on separate pages, in 30 s. This was to minimize the impact between responses by providing each answer in a separate line that the key concept repeats (Bahar, Johnstone & Sutcliffe, 1999). An example page layout is as follows:

Ecosystem:......................
Ecosystem:......................
Ecosystem:......................
Ecosystem:......................
Ecosystem:......................
Ecosystem:......................
Ecosystem:......................
Ecosystem:......................
Ecosystem:......................
Data Analysis:

A frequency table was prepared, showing the responses to each key concept and their frequency of repetition in the pretest and posttest for the WAT analysis. The concept network was then established by using the Cut-off Technique (Bahar, Johnstone & Sutcliffe, 1999) to reveal the relationships between the concepts. This technique takes the cut-off point as 3–5 points below the most repeated response in the frequency table for the key concept. The cut-off is then reduced periodically until all responses to the key concept emerge and its other steps in the network are completed. The responses to the key concept are listed by comparing them with formed sentences, and the unrelated or random responses were not evaluated (Gunston, 1980).

The thematic analysis helped analyze the sentences related to the key concepts. Two researchers separately examined and classified the sentences and determined their draft themes. If no consensus could be reached, the opinion of a third researcher was taken, and the final decision was made. The main themes constituted a unanimous decision of the researchers. These themes are classified as information/concept, affective, destruction/protection, and others.

Research Results:

Table 1 shows the number of responses (N) and frequency of participant repetition (f) for each concept in the WAT, applied before and after EBNE. The participants gave 320 different answers in the pretest and 337 different responses in the posttest. The repetition frequency of these responses increased from 916 to 1031. The highest increase in the repetition frequency was the responses to the key concepts of nature and biodiversity. There was a slight decrease in responses to the key concepts of the ecosystem (Table 2).

### Table 2. Total Number of Responses to Key Concepts and the Repetition Frequency of Repetition

<table>
<thead>
<tr>
<th>Stimulus words</th>
<th>Pre-implementation</th>
<th>Post-implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>F</td>
</tr>
<tr>
<td>Nature</td>
<td>68</td>
<td>205</td>
</tr>
<tr>
<td>National Park</td>
<td>59</td>
<td>163</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>66</td>
<td>162</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>74</td>
<td>205</td>
</tr>
<tr>
<td>Environmental Problems</td>
<td>53</td>
<td>181</td>
</tr>
<tr>
<td>Total</td>
<td>320</td>
<td>916</td>
</tr>
</tbody>
</table>

Figure 1 shows the concept network formed by the WAT and the responses given before the EBNE. Figure 1.a. shows the strongest cognitive structure, and Figure 1.d. shows the weakest cognitive structure.

**Cut-off Point 19 and above** (Figure 1.a.): At this level, the participants’ cognitive structures related to the key concepts are very limited. Only the key concept of “Nature” is associated with the “plant/plant species/green/foliage” response.
Cut-off Point 14 and above (Figure 1.b.): The key concepts of the national park, biodiversity, ecosystem, and nature have emerged. However, the number of responses associated with them is still limited. Participants associated the “protection/must be protected” to the national park key concepts, “species” to the biodiversity key concepts, “mindfulness/sensitivity/conscious/awareness” to the nature education key concepts, and “interaction/relational”, “living beings/liveliness”, “Inanimate/inanimate environment” to the ecosystem key concepts.

Cut-off Point 9 and above (Figure 1.c.): Environmental issues, the last key concept, were introduced at this level. The number of responses to key concepts also increased. The indirect relationship between the key concepts was introduced at this level. For example, all three key concepts of biodiversity, nature, and ecosystem received the common answer “living beings/liveliness”. Similarly, we see that the concepts of nature and biodiversity are indirectly related. The direct association of key concepts remains to be seen.

Cut-off Point 4 and above (Figure 1.d.): We see the highest response and the highest relatability between key concepts at this level. The number of responses to each key concept has increased significantly. The indirect relationships are established by giving common answers, and direct relations are also established among the key concepts. For example, the key concepts of the national park directly relate to the key concepts of biodiversity and nature.

Figure 1. a: Concept network formed according to the answers of the pretest (Cut-off Point 19 and above)

Figure 1. b: Concept network formed according to the answers of the pretest (Cut-off Point 14 and above)
Figure 1. c: Concept network formed according to the answers of the pretest (Cut-off Point 9 and above)

Figure 1. d: Concept network formed according to the answers of the pretest (Cut-off Point 4 and above)

Figure 2 presents the concept network prepared based on the findings of WAT applied after EBNE.
Figure 2.a: The concept network formed according to the answers of the post-test (Cut-off Point 19 and above)

Figure 2.b: The concept network formed according to the answers of the post-test (Cut-off Point 14 and above)
Figure 2.c: The concept network formed according to the answers of the post-test (Cut-off Point 9 and above)

Figure 2.d: The concept network formed according to the answers of the post-test (Cut-off Point 4 and above)

Cut-off Point 19 and above (Figure 2.a.): Here, only the concept of “nature” emerged in the pretest, and the concept of ecosystem emerged in the final test. The indirect correlation between the key concepts was introduced only in the pretest at the cut-off level of 9 and above. However, in the
posttests, the cut-off point appeared at the level of 19 and above. The participants associate key concepts of nature and ecosystem with the common responses to “living beings/liveliness”.

**Cut-off Point 14 and above** (Figure 2.b.): At this level, all key concepts have emerged. The participants indirectly associated the two key concepts by responding to that of biodiversity and nature as “plant/plant species/green/foliage”. The key concept of the national park is associated with “protection/must be protected”. The ecosystem key concept is associated with inanimate/inanimate environment and the environmental problems key concept with “pollution and water/river/sea pollution” responses. When this level is compared with the pretest, the number of key concepts and responses is more than the posttest.

**Cut-off Point 9 and above** (Figure 2.c.): At this level, the number of responses to key concepts has increased. The responses given are also higher-level concepts compared to the pretest.

**Cut-off Point 4 and above** (Figure 2.d.): Similar to the pretest, the highest relationship between response and key concepts is at this level. Like the previous level, here, the responses are higher than those of the pretest. The “flora and fauna” responses to the key concept of nature are some examples.

Table 3 shows the distribution of the sentences formed by the participants in the pretest and posttest according to the themes. When the overall table was evaluated, it showed that the participants formed more sentences in the posttest (N = 214) than in the pretest (N = 205), and the formed sentences were evaluated with more themes. In the “knowledge/concept” theme, they formed a total of 77 sentences and 5 misconceptions in the pretest and 96 sentences and 1 misconception in the same theme in the posttest. The number of sentences formed with the theme of “destruction/protection” has increased from 64 to 71. In the “Affective” theme, the number of sentences decreased from 60 to 42.

<table>
<thead>
<tr>
<th>Stimulus Words</th>
<th>Pre-implementation</th>
<th>Post-implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Information/Concept</td>
<td>Affective</td>
</tr>
<tr>
<td>Nature</td>
<td>6+1 MIS*</td>
<td>24</td>
</tr>
<tr>
<td>National Park</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>22+4 MIS</td>
<td>4</td>
</tr>
<tr>
<td>Environmental Problems</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>77+5 MIS</td>
<td>46</td>
</tr>
</tbody>
</table>

*MIS: Misconception

The number of sentences formed by the students in the “information/concept” theme increased from 6 to 15 about the key concept of “nature”. Misconceptions were also determined in one sentence. In the pretest, 17 participants defined nature as “a whole united with soil and water”. It corrected the definition of “the combination of living and inanimate beings” in the posttest. The number of sentences in the “affective” theme reduced from 24 to 10 (Table 3). In the sentences formed in the pretest, the living and inanimate environment were predominant, and only two sentences emphasized the wholeness of nature. In the last practice, the interaction between the elements was frequently mentioned, various ecosystems and biodiversity were emphasized, and the regional species were mentioned in sentences. Thus, we determined that they increased (Tables 4 and 5).
The total number of sentences related to the “national park” key concept remains equal in both practices. The distribution of these sentences according to themes doesn’t change remarkably (Table 3). The participants, in the sentences evaluated in the theme of “information/concept”, in both practices, emphasized the area, including various species that require protection. In the posttest, however, participants emphasized the legislation and laws. They even focused on sentences with the theme “destruction/protection” (Tables 4 and 5).

The number of sentences about the key concept of “biodiversity” increased from 38 to 41 (Table 3). The participants, in either case, make sentences about biodiversity under the theme of “information/concept”, which is rich and important in Turkey. However, we see that the sentences in the second practice are more explanatory and concrete. For example, in the first practice, “Biodiversity is very important for an ecosystem. (K5)” emphasizes that biodiversity is crucial. In the second practice, “Biodiversity is of great importance for the ecological balance of the living species. (K3)” also provides a reason for that mentioned importance. In the theme of “destruction/protection”, opposite to the first practice, participants frequently stated in the second practice that spaces belonging to living things should be protected to preserve biodiversity (Tables 4 and 5).

### Table 4. Pre-test Sentence Examples

<table>
<thead>
<tr>
<th>Stimulus Words</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information/Concept</strong></td>
<td><strong>Affective</strong></td>
</tr>
<tr>
<td>Nature</td>
<td>Alive and inanimate environment. A circular environment in which living and inanimate beings interact in nature. (K32).</td>
</tr>
<tr>
<td>National Park</td>
<td>Biodiversity is very rich in national parks. (K 15) The Place or region where plants and animals are protected in a certain environment (K 32)</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>There is an inverse relationship between biodiversity and environmental problems (K 21) Several species indicate the number of living things. (K 32)</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>Living and inanimate beings coexist in an ecosystem. (K 5) All ecosystems in the world are interrelated. (K 29)</td>
</tr>
<tr>
<td>Environmental Problems</td>
<td>These are the problems that arise with the developing industry and endanger living spaces. (K 7)</td>
</tr>
</tbody>
</table>
Table 5. Examples of Sentences Formed in the Post-test

<table>
<thead>
<tr>
<th>Stimulus Words</th>
<th>Theme</th>
<th>Information/Concept</th>
<th>Affective</th>
<th>Destruction/Protection</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>Affection</td>
<td>The whole of the interactions of living and inanimate (K 32). I now know the Apollo butterfly, the endemic species of Bursa. (K 1)</td>
<td>Nature is the mother of everything. (K 33)</td>
<td>Please, Let’s not leave any trace to nature other than our footprint. (K 21)</td>
<td>We need to spend time in nature. (K 4)</td>
</tr>
<tr>
<td>National Park</td>
<td>Affection</td>
<td>Protection of an area with different species exists (K 32). National Park legislation should be rearranged to include strict rules. (K 24)</td>
<td>We should give the necessary value to the national parks in our country. (K 20)</td>
<td>Pressure on national parks should be reduced. (K 15)</td>
<td>The entrance of national parks should be built aesthetically. (K 33)</td>
</tr>
<tr>
<td>Biodiversity</td>
<td></td>
<td>Allowing only a single species to live in an area reduces biodiversity. (K 11)</td>
<td>The most valuable of our wealth was our biological diversity. (K 13)</td>
<td>To preserve biodiversity, we must not destroy the living’s habitats. (K 19)</td>
<td>There had been so much biodiversity in life that we could not see. (K 16)</td>
</tr>
<tr>
<td>Ecosystem</td>
<td></td>
<td>Ecosystem diversity directly affects biodiversity. (K 2) In the ecosystem, every living thing has a niche. (K 11)</td>
<td>The balance of ecosystems is amazing (K 31)</td>
<td>If we could protect ecosystems, we would talk about our species’ diversity better to future generations. (K 25)</td>
<td>Ecosystems are above all ideological systems. (K 6) I learned about lake ecosystems. (K 19)</td>
</tr>
<tr>
<td>Environmental Problems</td>
<td></td>
<td>Many species are in danger of extinction because of environmental pollution. (K 5)</td>
<td>It is the betrayal of man to nature. It is his own grave digging. (K 14)</td>
<td>I saw how nature was massacred by unconscious tourism and people. (K 19) We must protect our environment with education. (K 34)</td>
<td>Developed societies have the least problems with nature. (K 25)</td>
</tr>
</tbody>
</table>

In the first practice of the key concept of “environmental problems”, the sentences related to the most destruction/protection were formed (N = 21). In the second practice, this number increased to 24. The sentences in the information/concept theme increased from 12 to 15 (Table 3). After examining the sentences in the destruction/protection theme in the first practice, we saw it was frequently emphasized that insensitivity and considering it irrelevant caused the environmental problems. These environmental problems should be prevented, people should be informed, and sensitivity should be increased. In the second practice, sentences emphasizing the importance of education were added. A sentence has also been formed about the pressure of tourism on nature. In both practices, the participants formed sentences containing the definition of environmental pollution and information/concepts according to their types, causes, and consequences. However, we understand from the examples of sentences formed in the first practice “events that cause problems to affect the living” and in the second practice, “chemical, physical, and biological pollution affecting the life of living things”. We find that the sentences formed in the second practice contained more ecological concepts (Tables 4 and 5).

The theme with the highest number of sentences formed by the participants about the key concept of “ecosystem” is the information/concept theme. In the first practice, 22 sentences and in the second practice, 24 sentences were formed. There are also misconceptions in 4 sentences in the first practice and 1 sentence in the second practice (Table 3). Misconceptions in the first practice are accepting humans as the most important element of the ecosystem, confusing ecosystem with ecology and habitat, and limiting it as a human-plant relationship. In the second practice, the misconception was reduced to one. For example, in the first practice, the participant defining the ecosystem as “the environment where living things interact with the inanimate” changed it to “the system where the
living and non-living things interact”. Only the participant, who mixed up the definition of ecosystem and ecology, continued this misconception in both practices. In this theme, during the first practice, we frequently see that the ecosystem contains living and inanimate elements and they are related. In the second practice, more concepts like ecological niche, biodiversity, and substance cycles were included in the sentences. The destruction/protection theme emphasized the pressures exerted on the ecosystem by humans in both practices (Tables 4 and 5).

DISCUSSION AND CONCLUSIONS

This study aims to determine the changes in the cognitive structures of EBNE participants regarding the key concepts of ecology after training through a WAT. The results showed that the type of response and the repetition frequency increased after EBNE. The number and variety of responses to a key concept received in the WAT are important indicators of concept acknowledgment (Bahar et al., 1999; Shevelson, 1974a). The increased number of responses was considered crucial in the key concepts of “nature” and “biodiversity”. This situation, which may be an important sign of cognitive empowerment, remains consistent with EBNE’s objectives and educational content.

The natural environment is a complex structure involving multidimensional relationships (Shepardson et al., 2007). It places the ecological concepts adjacent to each other and makes them difficult to understand (Hmelo-Silver, Marathe & Liu, 2007; Plate, 2010). It is important to establish this close relationship in the cognitive structure to understand these concepts effectively. The WAT is a technique that helps reveal this relationship (Bahar et al., 1999; Kurt et al., 2013; Shevelson, 1974a, Özata Yücel & Özkan, 2015). In the WAT, the number of responses for two different key concepts is directly proportional to the relatability of these key concepts with the cognitive structure (Bahar et al., 1999; Shevelson, 1974a). Concept networks show that the number of concepts associated with the posttest is higher than its pretest. This association was also made in the pretest but with the response of “Living beings/liveliness” given in the third step (Figure 1.c.) common to all three key concepts of “biodiversity”, “nature”, and “ecosystem”. In the posttest, it emerged in the first step (Figure 2.a.), with “Living beings/liveliness” as the common response to “nature” and “ecosystem” key concepts. This indicates a strong cognitive structure.

Another sign of the strong cognitive structure in the WAT is the quality of the responses and established relationships (Ayas, 2005; Özata Yücel & Özkan, 2015). When the concept networks were examined, we determined that the number of answers, types, and related concepts increased in the posttest, and the quality of the responses changed. For example, in the pretest, the concept of “nature” is given as the answers frequently used in daily life like “plant, green/foliage” and “liveliness”. In the posttest, additionally, more ecology-based concepts are given like "habitat", "fauna", "flora", and "lichen". This specified that before EBNE these concepts were more superficial in the participants’ cognitive structures. There was also a more subjective and deeper understanding of education according to its widespread use in the scientific field. (Bahar et al., 1999; Gunston, 1980, Nakiboğlu, 2008; Özata Yücel & Özkan, 2015; Shavelson, 1974).

When the number of responses to key concepts and their results from concept networks was evaluated, it was concluded that the participants of EBNE evolved their conceptual understanding of ecology in their cognitive structures related to the key concepts. Similar studies conducted in the literature also show that practice-based nature education helps strengthen cognitive structures (Bogner, 2010; Eaton, 2000; Eryaman et al. 2010; Gülay Ogelman, Önder, Durkan & Erol, 2015; Gülay Ogelman &Durkan, 2014; Keleş, Uzun & Varnaci Uzun, 2010; Balkan Kıyici, Atabek Yiğit & Seleem Darçın, 2014). The primary rule of the new nature education is that generally, it does not make life difficult for our successors. The things to avoid include that indifferent consumption of resources, destruction of natural areas, and overpopulation. Enforcing these rules is difficult as it inevitably contradicts selfish individual thoughts. A long educational process helps understand and internalize the ethics of nature. However, it is crucial to start nature education early on when children are interested in nature and living things. We must ensure that this interest and sensitivity are strengthened in the later stages of life. This makes nature education suitable and important for all age groups. Every
A correctly linked concept in the cognitive structure will ensure that nature’s patterns are read and interpreted correctly. Therefore, cognitive comprehension is useful as a part of education.

According to the themes determined after the EBNE, the maximum increase was in the sentences containing information/concepts. It was followed by sentences, including the theme of destruction/protection. The number of sentences related to the nature key concept has increased the most for the information/concept theme. The missing and erroneous information in the sentences formed in the second practice has also been completed and corrected after the training. The holistic view of nature has been emphasized in the sentences and various species and genera like the Apollo Butterfly (Parnassius apollo) and the Bambus Bee. These sentence analysis results support the conclusion that EBNE provides participants’ cognitive development related to ecological concepts. Rickinson (2001) also examined 110 different studies that included out-of-class education related to environmental education between 1993 and 1999. He showed that such nature education affected the participants’ environmental knowledge. The increase in all key concepts is similar to each other regarding destruction/protection.

In contrast to the themes of information/concept and destruction/protection, the number of sentences in the affective theme decreased in the posttest. The maximum decrease is in sentences related to the nature key concept, while the decrease in other key concepts is similar to each other. This decrease shows that the information/concept and destruction/protection have become more prominent in the participants’ cognitive structures after EBNE. However, this does not imply the weakness of the affective field. In EBNE, emphasizing the importance of ecological concepts, problems in nature, its precautions, and the protection of nature explains this prominence in cognitive structure. Many studies support the positive effects of nature education on the affective characteristics of students. Gowin (1981), Hungerford and Peyton (1978), and Hungerford and Volk (1990) said the objective of these educational approaches was to educate individuals who respect the environment. Dunlap and Heffernan (1975), Geisler, Martinson, and Wilkening (1977), Sia, Hungerford, and Tomera (1985) found that contact with nature might affect environmental concerns. Mygind (2009), O’Brien, and Murray (2007) found that long-term practices in school settings and the relationships between students in these practices positively affect students’ learning motivation and attitudes toward nature. Janssen (1988) reported that nature education promoted positive attitudes, while Drissner et al. (2010) reported that a short-term environmental education program positively affected environmental attitudes even after a half-day project. However, as this study states, Urban (1986) concluded that ecological information is not significant in the formation of environmental attitudes. Maloney, Ward, and Braucht (1975) stated that these two variables are not significantly related. It is vital for people to feel nature by experiencing it. Intertwining and interacting with nature can help understand nature conservation behavior. Nature studies are effective at this point in many studies (Bogner, 2010; Jung 2009; Nisbet et al. 2009; Mayer vs. McPherson Frantz 2004; Schultz 2002). According to the literature, the increase in the number of sentences related to destruction/protection in the posttest supports the effect of EBNE on the participants’ wishes and thoughts about protecting nature. When these trainings are given sufficient time, it helps individuals to develop long-term environmental protection awareness. It will encourage them to become more sensitive to the destruction of nature and willing to take environmental planning and action. This training helps realize an effort about human position and influence within the natural cycles of the ecosystem. They help focus on the complementary relationships in the components’ structure and function of the ecosystem and recognize the functioning and order in natural environments. It even supports perceiving nature.

In nature education, individuals needing to establish a more harmonious and more balanced relationship with nature by using scientific data should be excluded from the usual learner-teacher approach. Participants should identify nature-human-society relations and their problems by using nature as a practice environment and support their ability to understand and develop solutions to these problems. Sustainable development, usage of our consciousness, generations with a true nature perception, and a scientific, environmental awareness can reduce the harm that people can cause to their environment.
REFERENCES


Implementer Views on Whether Catch-Up Education Program in Primary Schools (Iyep) Could Be Performed Via Distance Education

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Abstract

Face-to-face education in many countries was suspended due to the global pandemic of COVID-19 declared by the World Health Organization (WHO) in 2020. The pandemic led to new searches in the academic process, and distance education gained importance in Turkey. However, the Catch-Up Education Program in Primary Schools was not taken into account while it was stated that educational services provided in resource rooms within the scope of inclusive education were to be continued via distance education. Accordingly, it was aimed to examine the views of classroom teachers who had implemented IYEP before on whether IYEP could be performed via distance education and to make an evaluation based on the first-hand experiences of implementers. To that end, the research was conducted with 22 participants in accordance with the ethical principles. Ethics committee approval was obtained for the study with the decision of Agri Ibrahim Cecen University Scientific Research Ethics Committee dated 08.09.2021 and numbered 206. All of the participants are experienced classroom teachers who have experience with IYEP and have performed distance education. The research was performed with the phenomenological design of qualitative research designs. The data were collected with a semi-structured interview form, and the interview questions were finalized after having been reviewed by two academics who are subject-matter experts. The data obtained in the research were subjected to descriptive analysis individually by the researchers and evaluated. It was concluded that IYEP could be continued via distance education when the face-to-face education could not be performed, but there were several concerns about the matter at hand. The participants often mentioned that distance education could not substitute for and be as effective as face-to-face education. Nevertheless, despite certain disadvantages, considering the contributions of IYEP in face-to-face education, it was found that distance education could be utilized so that shortcomings in learning would not accumulate and extend to the next year and that experiencing IYEP via distance education could provide ideas about future practices.

Keywords: COVID-19, IYEP, Distance Education, Primary School, Pandemic

DOI: 10.29329/ijpe.2022.467.18

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INTRODUCTION

The whole world has been trying to adapt to adversities inflicted by the Coronavirus (COVID 19) pandemic. The pandemic took the world by storm and adversely affected all the countries, especially their healthcare services. There is no doubt that education is one of the areas impacted by the pandemic. As in other countries, a great number of studies have been performed in Turkey for a qualified and quality education. Commonly described as creating an intentional and terminal behavioral change in individuals, education that plays a key role in human life refers to equipping individuals who will attain a place among the society with physical, moral and intellectual instruments, as argued by Durkheim (1956, p.71). This is a long-term process to be built starting from the basic education. Yet, there are students who cannot sufficiently draw on education for several reasons in our country like in several others. For various reasons, from the beginning of basic education, students start education in an advantageous or disadvantageous way according to their socioeconomic and cultural levels, and when these differences are not compensated, the gap in success gradually widens. TIMSS studies show that the differences in success stem from the problems starting from the basic education (Ozer at al. 2020). It is emphasized in the 2023 educational vision that every child needs to have options to become their best possible self and to be provided with adequate means to feel that they have those options at every moment of their academic life and to make a progress in the path of their choice (MEB, 2018, p.33). These opportunities are very important for disadvantaged groups on the basis of equality of opportunity and justice in education. Within this context, Ministry of National Education implements several supportive, catch-up and remedial programs to make up the incomplete learning and reinforce the learning needs. One of those programs is the Catch-Up Education Program in Primary Schools (IYEP).

IYEP

IYEP is a supportive program for primary school third-graders who have been found not to need any special education but to fail to acquire the learning outcomes included in Turkish and mathematics curricula and within the scope of IYEP. It is also aimed with the program to support students psychosocially. This program is not an alternative to the current curricula, and the learning outcomes included in the program are chosen from among the outcomes on the first- and second-grade levels. 3 modules and their associated learning outcomes are included in the program from Turkish and mathematics courses (MEB, 2019). The following table presents the learning outcomes included in the program (MEB, 2019, p.4).

<table>
<thead>
<tr>
<th>Course</th>
<th>Field/sub-field of learning</th>
<th>Number of Learning Outcomes in Module 1</th>
<th>Number of Learning Outcomes in Module 2</th>
<th>Number of Learning Outcomes in Module 3</th>
<th>Total Number of Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>TURKISH</td>
<td>Listening-Watching</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Speaking</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Reading</td>
<td>-</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>-</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>MATHEMATICS</td>
<td>Natural Numbers</td>
<td>4</td>
<td>3</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Addition and Subtraction</td>
<td>6</td>
<td>4</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiplication and Division</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL NUMBER OF LEARNING OUTCOMES</td>
<td></td>
<td>13</td>
<td>17</td>
<td>8</td>
<td>38</td>
</tr>
</tbody>
</table>
As seen in table 1 presenting the learning outcomes, 5, 72, and 19 class hours are recommended for Modules 1, 2, and 3 of the Turkish course, respectively, accounting for 96 class hours in total. 24, 24, and 16 class hours are recommended for Modules 1, 2, and 3 of the mathematics course, which add up to 64 class hours in total. Accordingly, total IYEP duration is 160 hours. The target group of the program includes disadvantaged students such as those who have failed to acquire the learning outcomes listed in Table 1, children who are under temporary protection, children of seasonal agricultural workers, and children of refugee-immigrant and semi-nomadic families. Simomez (2016) states that make-up programs generally give priority to main disciplines such as mathematics, reading and science. IYEP can also be evaluated with this approach.

Implemented in the academic year of 2017-2018 for the first time as a pilot practice in 12 provinces, the program started to be implemented for third- and fourth-graders all around the country in the academic year of 2018-2019. For selecting the students to be enrolled in the program, a Student Enrollment Instrument (SPI) is implemented, and at the end of the 160-hour program, a Student Assessment Instrument (SAI) is performed on IYEP students. SPI aims to make an evaluation of student for recognition, monitoring and formation purposes whereas SAI aims to perform an outcome-oriented assessment to determine whether the students have acquired the IYEP learning outcomes. In this context, the SPI was applied to 2,219,315 students in the 2018-2019 academic year. In line with the results, 431,493 students were offered the IYEP program and 302,097 students took courses within the scope of the program. According to the results of the SAI applied at the end of the application, 89.77% of the students successfully completed the program. It was decided that the program would only continue for third-graders as of 2019-2020 (Gencoglu, 2019). The following table presents the learning outcomes included in the program.

Table 2. IYEP Learning Outcomes

<table>
<thead>
<tr>
<th>MODULE 1</th>
<th>MODULE 2</th>
<th>MODULE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.M1.2. Answer questions about what they have listened to/watched.</td>
<td>T.M2.2. Recognize and vocalize the letter.</td>
<td>T.M3.2. Answer questions about the text they have read.</td>
</tr>
<tr>
<td>T.M1.3. Talk about a subject within a certain framework.</td>
<td>T.M2.3. Write down letters in accordance with the technique.</td>
<td>T.M3.3. Write down short texts.</td>
</tr>
<tr>
<td>T.M2.4. Read syllables and words.</td>
<td>T.M2.5. Write down syllables and words.</td>
<td></td>
</tr>
<tr>
<td>T.M2.6. Write down numbers in accordance with the technique.</td>
<td>T.M2.7. Read simple and short sentences.</td>
<td></td>
</tr>
<tr>
<td>T.M2.10. Do writing practices.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
M.M1.1. Determine the number of objects in a group with number of objects up to 20 (including 20) and write down that number in figures.
M.M1.2. Count rhythmically forward to 100 (including 100) in ones, fives and tens.
M.M1.3. Count within 20 (including) in twos forward and ones and twos backward.
M.M1.4. Show a group of objects with an amount between 10 and 20 (including 10 and 20) by dividing it into tens and ones, and write down in figures and read the number corresponding to those objects.
M.M1.5. Comprehend the meaning of addition.
M.M1.6. Perform addition with natural numbers of which sum is up to 20 (including 20).
M.M1.7. Solve problems that require addition with natural numbers.
M.M1.8. Comprehend the meaning of subtraction.
M.M1.9. Perform subtraction with natural numbers up to 20 (including 20).
M.M1.10. Solve problems that require subtraction with natural numbers.

M.M2.1. Determine the number of objects in a group with number of objects up to 100 (including 100) and write down that number in figures.
M.M2.2. Name the digits of natural numbers smaller than 100 on models, state the digit values of the numbers in the digits.
M.M2.3. Count within 100 in twos, fives and tens; 30 in threes; and 40 in fours forward and backward.
M.M2.4. Perform addition with natural numbers of which sum is up to 100 (including 100) with and without carry.
M.M2.5. Solve problems that require addition with natural numbers.
M.M2.6. Perform subtraction with natural numbers up to 100 that does and does not require breaking apart tens.
M.M2.7. Solve routine problems that require addition and subtraction with natural numbers.

M.M3.1. Explains that multiplication means repeated addition.
M.M3.2. Perform multiplication with natural numbers.
M.M3.3 Solve problems that require multiplication with natural numbers.
M.M3.4. Use the meanings of grouping and sharing.
M.M3.5. Perform division, use the division sign (÷).

Source: Catch-Up Education Program in Primary Schools (2019, p.5)

The ministry prepared activity and guidance books to enable students to acquire the learning outcomes in Table 2 and provide psychosocial support. These books were sent to students and teachers and offered to the disposal of relevant parties on MEB’s website.

METHOD

Purpose

It was aimed to explore the views of classroom teachers who had implemented IYEP before on whether IYEP could be implemented via distance education. For this purpose, answers to the following questions were sought:

1. What are your views on whether IYEP could be implemented via distance education?
2. What could be the advantages of implementing IYEP via distance education?
3. What could be the disadvantages of implementing IYEP via distance education?
4. What could be the alternative practices for IYEP students if the pandemic would be extended?
5. What would you like to add within the context of distance education and IYEP?

Research Design

The research was performed with the phenomenological design of qualitative research designs. Phenomenology focuses on human experiences through which social reality is formed and gives weight to semantics revealed by the experience to understand the social reality (Ersoy, 2016). In phenomenological studies, the main point which researchers concentrate on is the shared experiences of participants about a given incident, concept, or phenomenon (Güler, Halıcıoğlu, and Taşpin, 2013, p.234). All the participants are classroom teachers experienced both in implementing IYEP and exercising distance education during the pandemic.
Study Group

Data sources in phenomenological studies are individuals who have experienced the research subject and are able to reflect it (Yıldırım and Şimşek, 2006, p.74). Therefore, the study group consisted of 22 classroom teachers with IYEP experience.

Table 3. Demographic Information of Participants

<table>
<thead>
<tr>
<th>Personal Information</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
</tr>
<tr>
<td>Professional Seniority</td>
<td></td>
</tr>
<tr>
<td>5-10 Years</td>
<td>9</td>
</tr>
<tr>
<td>10-15 Years</td>
<td>9</td>
</tr>
<tr>
<td>15-20 Years</td>
<td>4</td>
</tr>
<tr>
<td>IYEP Experience</td>
<td></td>
</tr>
<tr>
<td>1 Year</td>
<td>18</td>
</tr>
<tr>
<td>2 Year</td>
<td>2</td>
</tr>
<tr>
<td>3 Year</td>
<td>1</td>
</tr>
<tr>
<td>4 Year</td>
<td>1</td>
</tr>
<tr>
<td>Training Level</td>
<td></td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>20</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>2</td>
</tr>
</tbody>
</table>

The criterion for selecting participants in the study using the criterion sampling of purposive sampling methods was to have served with in IYEP. 5, 1, 1, 2, and 13 of the participants work in the provinces of Sivas, Balıkesir, İstanbul, Niğde, and Yozgat, respectively. As seen in Table 3, of the participants, 63.64% are women and 36.36% are men, and their professional experiences varied between 5-10 years (40.91%), 10-15 years (40.91%), and 15-20 years (18.18%). Of the classroom teachers, 90.91% have a bachelor’s degree while 9.09% have a master’s degree, and they had 1 year (86.37%), 2 years (9.09%), 3 years (2.27%) and 4 years (2.27%) of IYEP experience.

Data Collection and Analysis, and Ensuring Data Credibility

In phenomenological studies, interviews are performed to explore experiences and semantics about the phenomena in question (Büyüköztürk et al., 2013, p.20). The data were accordingly collected with semi-structured interview forms. In the forms, the participants were explained that their names would not be used, codes such as Teacher 1 (T1), T2 would be utilized, the data would not be used outside the research, ethical principles would be observed, the research was totally on voluntary basis, and their consents were received. Ethics committee approval was obtained for the study with the decision of Ağrı İbrahim Çeçen University Scientific Research Ethics Committee dated 08.09.2021 and numbered 206. Interview forms were e-mailed to the participants, and they responded via e-mail. The interview questions were reviewed by two academics who are specialized in their fields and finalized upon their feedbacks.

The data obtained in the research were subjected to a descriptive analysis. As stated by Yıldırım and Şimşek (2006, p. 224), in a descriptive analysis, data are interpreted and summarized in a framework set by prespecified themes or research questions. Direct citations are often utilized to provide the reader with information more explicitly in descriptive analysis. Establishing causation and making comparisons among findings can improve the quality of interpretations.

FINDINGS

In the research, the participants were firstly asked about their views on whether IYEP could be performed via distance education, and the following findings were achieved: While 8 of the participants said that it could be realized, 5’ said it could not be realized, 2 of them said that it could be done for some modules, and it could not be done for some, while 7 participants said that it could be done, but it would not be efficient. Some of those views can be found below:
“IYEP can be performed via distance education. This should be supported all the way and put on the agenda. Due to this pandemic we are going through, this opportunity should be offered to students under equality of opportunity in education. When we will be back to face-to-face education, parents who do not want to send their children to school due to coronavirus and students should have this right.” (T9)

“I think IYEP can be carried out via distance education. While activities of Resource Rooms are provided via distance education, I reckon that it would do no harm to carry IYEP which is a quite abbreviated version with respect to learning outcomes via distance education.” (T19)

Some of the views on the fact that IYEP could not be performed via distance education are given below:

“It could not be performed. Because such students need to be kept under constant control as they become distracted quickly. You cannot make it happen via distance education.” (T17)

“IYEP could not be performed effectively via distance education. Because students that are enrolled in IYEP are generally those who failed to express themselves in the classroom and could not receive the necessary help from the parents. Those students should be trained through face-to-face education.” (T22)

The following views are about how IYEP could be performed via distance education, but it would not be effective and efficient:

“As a classroom teacher, I think that IYEP would be difficult via distance education, and the desired outcome might not be achieved. For example, when there was a transition to distance education, a planning could have been made for IYEP and it could have continued through face-to-face education like the Educational Support and Catch-Up (DYK) courses. But they did not do that, and if it were to be performed via distance education, it would not be as successful as face-to-face education. Distance education would be insufficient to enable a student who has fallen behind to catch up with the level of their peers. IYEP could be conducted via distance education to a certain extent, but it should be regarded as the last resort.” (T2)

One of the views are about how IYEP could be performed via distant education for some of the modules and not be performed for some others:

“Since it is difficult to conduct IYEP with students in need even face-to-face, I do not think it would fit the purpose via distance education. It might depend on the module. For example, in mathematics, module 4 students could be taught via distance education. But I think that module 1, either for Turkish or mathematics, could not be provided to module 1 students via distance education.” (T21)

In light of the views given above, majority of the participants thought that IYEP could be implemented via distance education and based their views upon the following foundations: Students who have fallen behind with respect to equality of opportunities in education should be given this opportunity. It could be done successfully with continuous participation of students, attitudes of parents and efforts of teachers. Distance education could be executed in IYEP as successfully as in other courses. In this period during which services of resource rooms can be provided via distance education, it is okay to implement IYEP via distance education as well. Secondly, the participants were asked about the possible advantages of implementing IYEP via distance education; and the findings on their answers are summarized in the table below.
Table 4. Views on possible advantages of implementing IYEP via distance education

<table>
<thead>
<tr>
<th>Views</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological interest and skills might be increased.</td>
<td>1</td>
</tr>
<tr>
<td>Parents might monitor their children and notice their deficiencies more easily.</td>
<td>3</td>
</tr>
<tr>
<td>It could enable continuity in courses and make students not be estranged from courses and increase interest in courses.</td>
<td>4</td>
</tr>
<tr>
<td>Different senses of students could be addressed through computer environment.</td>
<td>2</td>
</tr>
<tr>
<td>It might be an opportunity to fill the gaps in the subjects learned incompletely.</td>
<td>5</td>
</tr>
<tr>
<td>It might be advantageous in terms of cost, time, and health.</td>
<td>4</td>
</tr>
<tr>
<td>Distance education is better than no education at all.</td>
<td>1</td>
</tr>
<tr>
<td>It has no advantages.</td>
<td>2</td>
</tr>
</tbody>
</table>

Views on the possible advantages of implementing IYEP via distance education, as presented in the table, can be exemplified with some of the views below:

“If full participation of students can be ensured, especially in the case of students in rural areas who have no internet access at schools, students can be supported online with visuals and videos in multiple ways of instruction so that they can achieve retentive learning; this is among its advantages. Rather than the fact that a student does not continue IYEP and falls behind compared to the class level, they can make a progress to some extent when IYEP is implemented via distance education. This is also an advantage.” (T3)

“It would prevent students from falling behind the gains they should acquire in the educational life. It would make students feel valuable. Since face-to-face education is not much possible during the pandemic, it would prevent students from falling behind their peers greatly.” (T16)

As seen from Table 4 and the participant statements, the possible advantages of implementing IYEP via distance education include that incomplete learning could be remediated, alienation from school and courses could be prevented and students’ attention could be drawn by addressing different senses. Next, the participants were asked about the possible disadvantages of IYEP if it were to be implemented via distance education, and findings on their answers are given in the table below:

Table 5. Views on possible disadvantages of implementing IYEP via distance education

<table>
<thead>
<tr>
<th>Views</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is disadvantageous for students who has no sufficient technical infrastructure.</td>
<td>1</td>
</tr>
<tr>
<td>Teacher’s incompetency in technical matters</td>
<td>2</td>
</tr>
<tr>
<td>Classroom management, use of materials, methods and techniques are limited.</td>
<td>3</td>
</tr>
<tr>
<td>It could become tiresome for teachers.</td>
<td>3</td>
</tr>
<tr>
<td>Looking at the monitor for extended times can adversely affect child’s development.</td>
<td>1</td>
</tr>
<tr>
<td>Student might attend the course less frequently.</td>
<td>3</td>
</tr>
<tr>
<td>Difficulty of distance education over face-to-face education.</td>
<td>3</td>
</tr>
<tr>
<td>Difficulty in motivating students for the course.</td>
<td>2</td>
</tr>
<tr>
<td>Students would have less chance to socialize.</td>
<td>3</td>
</tr>
<tr>
<td>It has no disadvantages.</td>
<td>2</td>
</tr>
<tr>
<td>Other views.</td>
<td>3</td>
</tr>
</tbody>
</table>

Some of the views summarized in Table 5 can be found below:

“Since students in need for IYEP are already behind their peers, they are disadvantageous. Assuming that another reason for academic failures is financial problems, IYEP via distance education would present a disadvantage for students with no technical infrastructure. Although all conditions would be met, if the teacher is incompetent in technical
matters (for example, use of Web 2.0 tools), it presents another disadvantageous situation.” (T1)

“It would be difficulty for teachers to control what students do in IYEP implemented via distance education. It would be hard to notice and overcome problems in terms of notebook use, punctuation and rules of writing. Materials, methods and techniques are limited.” (T5)

“While it is already hard with the difficulty in reaching out to all of those students and attending to them one-on-one, it would be harder with distance education and our students would feel that they fell behind their peers.” (T6)

“As IYEP students are those who have fallen behind their friends, they need to be taken care of one-on-one. Therefore, distance education might not be much effective on the student. It would harm their eye health. It would prevent them from socializing. They could have problem in concentrating on the course in computer environment. It might be difficult to receive feedback and make assessment-evaluation via distance education.” (T16)

Views on the possible disadvantages of implementing IYEP via distance education are concentrated rather on failure to participate in the course due to lack of technical infrastructure, failure to ensure student engagement, decreased socialization, and increased difficulty of classroom management. However, despite all this, it would be an appropriate approach to minimize the disadvantages as much as possible and to improve the procedures.

Next, the participants were asked about what could be done alternatively for IYEP students if the pandemic were to extend, and the answers are summarized in the table below.

Table 6. Recommendations of alternative practices for IYEP students if the pandemic was to extend

<table>
<thead>
<tr>
<th>Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>IYEP courses could continue on Educational Information Network (EBA).</td>
</tr>
<tr>
<td>Face-to-face education could be offered.</td>
</tr>
<tr>
<td>Support could be provided with respect to source books and materials.</td>
</tr>
<tr>
<td>Only these students could be trained through face-to-face education.</td>
</tr>
<tr>
<td>Parents could be included in the process for parental support and cooperation.</td>
</tr>
<tr>
<td>Distance education could be continued on online platforms such as EBA, Zoom.</td>
</tr>
<tr>
<td>IYEP could be revised to accommodate distance education.</td>
</tr>
<tr>
<td>If IYEP were not to be possible via distance education, deficiencies could be remediated through IYEP, trainings, etc. for fourth-graders as well.</td>
</tr>
</tbody>
</table>

According to the views summarized in table 6, majority of the teachers thought that parents should be included in the process for parental support. Other than that, how face-to-face and one-on-one education could be provided for IYEP students was also mentioned. Some of the relevant views can be found below:

“Since EBA TV channels have the widest network of communication, it could be more useful as it does not require equipment such as internet and tablets, but its efficiency is debatable. Modular courses prepared by the ministry could be given by the teachers on EBA and students could be included in IYEP.” (T1)

“At the moment, only the third-graders can join IYEP. If IYEP could not be provided via distance education during the pandemic, I think a training course should be opened for these students to make up their deficiencies in the fourth grade.” (T3)
“Face-to-face education could be performed at weekends as in DYK. Given the size limitation of IYEP classes, it does not pose a risk in terms of the pandemic.” (T12)

“Individual training with such students has been much more efficient. Therefore, individual training at different times rather than training in the classroom environment would be more appropriate for health during the pandemic and would yield individual success in a short time.” (T21)

The warnings made by the implementers should be taken into account so that students would not continue their education with incomplete learning if the pandemic were to extend. This procedure is especially of importance to IYEP students who have incomplete learning. Finally, the participants were asked about what they would like to add in terms of IYEP and distance education, and their relevant views are given below:

“... The fact that refugee students have been in more need for IYEP has required certain changes in guidance books.” (T1)

“Distance education can never substitute for face-to-face education. There should be a sensory interaction with students. Even though courses in classrooms were suspended at schools during the pandemic, IYEP as a program that involves less students could be implemented face-to-face, and by this means, the situation could be turned into an opportunity for students who have fallen behind in reading-writing or in other courses for unforeseen reasons.” (T2)

“I want to talk about especially in the case of big schools. Instead of the multigrade class mentality, individual education could be provided for each grade level. This would alleviate the burden of teacher and enable them to work more willingly.” (T4)

“I think all our students should acquire literacy and certain mathematical skills... The fact that classroom teachers were not paid when IYEP started, that they were paid for 1 class hour when there was no teacher participation and that subject-matter teachers were paid for 2 class hours in the support courses negatively affected my perspective of this program. Indeed, it is the case for my colleagues. Is the course I teach less important or less valuable than subject-matter teacher’s course?” (T6)

“I think distance education will be in our lives for a while more. That is why participation of IYEP students should be ensured without neglecting them further.” (T12)

“It is difficult to motivate students at certain times in daily courses. Therefore, daily courses should be as many as the number of courses in which students can be active.” (T17)

The participants mostly emphasized in their statements that there should be cooperation with parents during distance education; programs should be accommodated in consideration of students’ attention and motivation; participation in the courses should be ensured without allowing for an increase in incomplete learning; one should attach the required importance to IYEP and teachers need to be paid like in DYK; payment and paperwork affect teachers negatively; the priority is face-to-face education, but when it is not possible, educational activities should alternatively continue via distance education without wasting any time.

**DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

First of all, the participants were asked whether IYEP could be implemented via distance education. 8 of them thought that it could, 7 stated that it could but it would not be effective and efficient, 5 thought that it could not, and 2 reported that it would be possible for some modules and not for some others. In some research, the students found activities of distance education implemented during the COVID-19 pandemic to be sufficient and useful (Pınar and Dönel Akgül, 2020; Yurtbakan
and Akyıldız, 2020). Similar results were achieved in a study on distance education experiences of primary school students with reading difficulty. In the said study, the students and parents argued that the distance education process was helpful (Sirem and Baş, 2020). In a study examining the views of faculty members on distance education practices in Turkey during the COVID-19 pandemic, while there were negative points such as lack of infrastructure, unpreparedness for the procedure, and inequality of opportunity for students in accessing the system, the participants found distance education to be positive in terms of ensuring the continuity of emergency education, providing technological literacy, and gaining an unlikely experience (Altunpuluk, 2021). Based on the abovementioned studies, it is possible to draw conclusions that support the implementation of IYEP via distance education.

Secondly, the participants were asked about their views on the possible advantages of implementing IYEP via distance education. In the answers received, it was stated that IYEP was an opportunity to eliminate learning deficiencies, to ensure attendance, to enable parents to follow the student better, to increase students’ interest and skills in technology, and to be advantageous in terms of health, especially during the pandemic period.

As a follow-up for the second question, the participants were asked about the possible disadvantages of IYEP to be implemented via distance education. Disadvantages that may occur in the answers received: It can be listed as the decrease in students' participation in the lesson, it can be tiring for teachers and students, socialization opportunities may be less, classroom management may be difficult, and it may cause inequality of opportunity for students who do not have sufficient technical infrastructure.

In the literature, there are results on advantages and disadvantages of distance education in line with the data presented above (Tekin, 2015; Şenkal and Dinçer, 2012; Uşun, 2006; Deveci, 2019). In the case of studies performed within the context of IYEP, in a thesis study in which IYEP was evaluated by teachers and administrators, it was concluded that IYEP’s principles, type and content of the program, and its approach to assessment and evaluation are quite effective and that the program is partly effective in its special objectives (Avlukyar, 2019). In another thesis study, it was stated that IYEP reinforcement for Turkish course affected student achievement positively (Sardogan, 2019). In that study, it was also observed that motivation of the students from upper and moderate socioeconomic levels was affected positively whereas the students from lower socioeconomic level were not affected. In a research reviewing teacher views on IYEP, the positive aspects as reported by the participants included allowing for the remediation of student deficiencies; opportunity to take care of students individually; increasing confidence among students; and appropriate class size for the procedure. The negative aspects suggested by the teachers included inadequate duration for implementing the program; limited materials; tiresomeness of the program; and wearing students down (Dilekçi, 2019). It was reported in another research in which IYEP process was evaluated by teachers that student selection was not proper, there were missing points in the planning, and it fell short of its goal (Yıldız and Kılıç, 2020). Turkish Association of Education (TED) states in its 2018 educational evaluation report that IYEP has the potential to create a long and retentive effect in the remediation of incomplete learning among students within the program and in their achievements in upper grade levels through learning support in earlier year of education (TEDMEM, 2019, p.137).

Fourthly, the opinions of the participants on what can be done as an alternative practice for the education of the students within the scope of IYEP were taken in case the pandemic process continues. At this point, for students within the scope of IYEP; suggestions such as, receiving parent support, continuing face-to-face education, providing resource books, material support, continuing distance education through online platforms eba, zoom etc. were made.

Finally, the participants were asked what they would like to add within the scope of IYEP and distance education, and in the answers they received, it was emphasized that the
parents should definitely be involved in the education process, and that the scope of IYEP could be expanded to include the 2nd and 4th grades. According to the statement made by the Ministry of National Education, as of January 2022, it has been decided to apply IYEP to the 4th grades as well. The main factor here is that IYEP was not implemented due to the interruption of face-to-face education.

In a research that examined how suitable primary school curricula were for distance education which became widespread following COVID-19, it was concluded that most of the learning outcomes in the curricula could be adapted to distance education and some of the outcomes should be revised so that there would be no loss of learning (Koc, 2021). Therefore, in the periods during which face-to-face education cannot be executed, the abovementioned deficiencies and concerns should be removed to continue assisting the IYEP students. As suggested by Gencoglu (2019, p.876), it is an important endeavor to reduce the risk of falling behind for those students by detecting incomplete learning at early stages and providing support at early ages. Moreover, experiences to be gained in the process could be of use to collect data on the topics including more effective use of technology in face-to-face education, educational practices that combine face-to-face and online methods, and preparedness for distance education in case of emergencies (Yildirim, 2020, p.10). It is essential to take necessary precautions considering that it could cause inequality of opportunities in education for socioeconomically disadvantaged students and that lack of individuals who would guide the use of those technologies could further deepen the inequality (Emin, 2020). Despite some of the disadvantages and risks mentioned above, it is possible to minimize the risks and support IYEP students in need via distance education through good planning and infrastructure. Moreover, given the advantages of IYEP in face-to-face education, it is thought that an experience of IYEP via distance education could provide ideas about future practices so that shortcomings in learning would not accumulate and extend to the next year.

As a result, compensation and support programs similar to IYEP are applied to students in also other countries. In many studies in the literature, it has been stated that such support programs contribute to social justice and equality of opportunity in education (Ozer and Suna, 2021; Cam Tosun, 2021; Ozer et al. 2021; Kocak and Ozdemir, 2019; Tomul, 2009). In addition, it has been seen in studies that these support programs provide many positive contributions to students in terms of social and psychological as well as academic success of students (Rai and Penjor, 2021; Yolak et al., 2019; Rai and Yadav 2016; Kasran et al. 2012).

The following recommendations can be made in light of the research findings:

- Efforts could be made towards remediating the shortcomings within the procedure and eliminating the concerns of teachers, parents, and students.

- IYEP could be revised within the context of distance education and accommodated for distance education after inadequacies have been alleviated in line with relevant studies.

- IYEP courses could be provided on EBA TV.

- Programs could be conducted on several platforms for parents to include them in the process and have their support.

- A separate support in terms of infrastructure could be offered for IYEP students.
REFERENCES


Özer, M., Suna, H. E., Şensoy, S., Mete, C., Gençoğlu, C., Numanoğlu, K. V., & Göl, M. N. (2021). The Turkish National Remedial Program (TNRPs) to Combat the Negative Effects of the...


Revealing Pre-service Teachers’ Mind Maps on STEM Education through STEM Images*

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Abstract

STEM education (based on the integration of the science, technology, engineering and mathematics disciplines) has recently been an integral part of education system and curriculum in many countries aiming to be more technologically competitive in this age of innovation. While the importance of STEM education has gradually increasing in education system with the complexities of today’s world, revealing pre-service teachers’ mind maps on STEM education and preparing them for STEM education is a crucial issue since the readiness of the teachers affects the quality of education. In this context, the aim of this study is to reveal pre-service science and mathematics teachers’ mind maps on STEM Education through STEM images. The research group consists of 6 pre-service teachers (3 of them are pre-service science teachers (PST) and 3 of them are pre-service mathematics teachers (PMT)) who are 4th grade level students from a public university in Istanbul, Turkey. In current research, case study design was used. The data of study were collected through drawings and focus group discussion. The data were analyzed with thematic analysis through Integrated Teaching (IT) Framework. As a result, 41 codes about pre-service teachers’ mind maps on STEM education were determined under 14 categories of 5 themes of IT Framework. The results of this study are crucial in terms of having potential to guide educational policy makers, curriculum developers, researchers and in-service and pre-service teachers about STEM education.

Keywords: Mind Maps on STEM Education; Pre-Service Mathematics Teachers; Pre-Service Science Teachers; STEM Education; STEM Images

DOI: 10.29329/ijpe.2022.467.19

* This research was presented as oral presentation at 2019 ESERA Conference in Bologna, Italy, August 26-30, 2019.

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INTRODUCTION

One of the most important aims of education system is to raise our students with key skills and competences which are required for today’s complex life. In this age of innovation, we should give students an education to make them be able to think, be able to explain what they think, be able to make research and analyze what they get. In recent years, many countries around the world strive to organize their education system to be more technologically competitive and they build the capacity of students to become more innovative by developing their 21st century skills such as critical thinking, creativity, problem-solving, collaboration etc. At this point, STEM education (based on the integration of the science, technology, engineering and mathematics disciplines) has been an integral part of our education system and curriculum in Turkey as well as in other countries to enhance students’ in-depth understanding of each discipline, key skills and competences like inquiry, problem solving, critical thinking, communication and collaboration needed for their both daily and professional lives. While the importance on STEM education has gradually increasing in education system with the complexities of today’s world, revealing pre-service teachers’ mind maps on STEM education and preparing them for STEM education is important issue since the readiness of the teachers affects the quality of the education. In this context, the purpose of the current research was to reveal pre-service teachers’ mind maps on STEM Education. That is, how pre-service teachers structure STEM Education in their minds was investigated in this study.

Research question of study

(1) What are the pre-service science and mathematics teachers’ mind maps on STEM education?

STEM education

STEM education has been defined in many different forms ever since it has become a greater focus in learning environments. However, it is obvious that there is a need to better define what STEM education is rather than defining only the terms: science, technology, engineering, and mathematics in parentheses (Brown, Brown, Reardon & Merrill, 2011). STEM education is an interdisciplinary approach that brings four disciplines of science, technology, engineering and mathematics together in a real-life context (Bybee, 2010; Corlu, Capraro and Capraro, 2014) with the learning approaches required to find a solution to a problem (Fioriello, 2010; Lantz, 2009). Merrill (2009) stated that “STEM teaching and learning focuses on authentic content and problems, using hands-on, technological tools, equipment, and procedures in innovative ways to help solve human wants and needs.” According to Martín-Páez et al (2019), STEM education help students improve deeper understanding of each STEM discipline contextualizing concepts. STEM education also focuses on motivating students and improving their integrated STEM knowledge and skills (Rinke et al., 2016). According to National Science Board (2007), STEM education can contribute to improve critical thinking, analytical thinking and problem-solving skills of students by leading to better real-world connections. Although the emphasis on STEM education has been increasing day by day in education system, most of the teacher education programs have not been making enough effort to prepare pre-service teachers for STEM education. Ejiwale (2013) stated that one of the important barriers to successful implementation of STEM Education is poor preparation and shortage in supply of qualified STEM teachers. It is critical issue to prepare pre-service teachers for teaching STEM-subjects (Honey et al, 2014) since it is expected that todays’ teachers should be able to raise students knowing how to solve problems that they will face in their careers as scientists and engineers (Wang et al, 2020). Preparing teachers for STEM education should be a national priority since the readiness of the teachers affects the quality of the given education and also teachers are the determinants of the “quality and quantity of K-12 STEM education” (Nadelson et al., 2012, p.69). Radloff and Guzey (2016) emphasized that it should be known how pre-service teachers conceptualize STEM education for creating effective pre-service teacher trainings for STEM.
Literature review

Perceptions of STEM education

Developing pre-service teachers’ conceptions of STEM education is one of the most critical points to create effective STEM based training in future classrooms. If pre-service teachers’ conceptions improve, they can feel more comfortable with STEM implementations (Radloff and Guzey, 2016). In the literature, there are several studies which were conducted on teachers’ perceptions, views, attitudes and professional development on STEM education (Asghar et al., 2012; Corlu, Capraro and Corlu, 2015; Dare et al., 2019; Han et al., 2015; Nadelson et al., 2013; Ring et al., 2017; Stubbs and Myers, 2016). Bell (2016) stated that the teacher perception, personal knowledge and understanding on STEM education, was associated with the effectiveness of STEM implementation in the classroom environment. From this perspective, Asghar et al. (2012) reported a professional development program to improve secondary science and mathematics teachers’ abilities in teaching STEM education through problem based approach. Nadelson and colleagues (2013) also implemented a professional development program for elementary teachers and investigated their attitudes and efficacy for teaching inquiry-based STEM. In addition, some studies investigated in-service and pre-service teachers’ views, understanding or mental readiness on integrated STEM education (Corlu, Capraro and Corlu, 2015; Eroğlu and Bekttaş, 2016; Han et al., 2015; Radloff & Guzey, 2016; Stubbs and Myers, 2016; Wong et al., 2016) and were conducted with science and mathematics teachers generally. These studies revealed that in-service or pre-service teachers showed positive attitudes or represented the importance of STEM education; but they have some difficulties to transfer their knowledge into implementation in classroom setting. In other words, they encounter some challenges while implementing STEM and they do not exactly know how they should be deal with them. It can be seen that the professional development is needed for both in-service and pre-service teachers, because it provides to build self-construction of pre-service teachers in order to understand and implement STEM education while in-service teachers can develop their existing skills in terms of STEM teaching. At this point, teachers need to interpret the curriculum flexibly, and they should be able to go outside the curriculum in terms of their students’ readiness and interests. Sanders (2009) stated that teachers are responsible for integrating their subject area with other STEM disciplines beyond being expert on their own subject area. From this perspective, in order to achieve effective STEM implementations, understanding and assessing teachers’ readiness in terms of pedagogical and content knowledge is important. In other words, STEM education requires that teachers should be able to utilize natural and active exchanges of knowledge, skills, and beliefs between all STEM disciplines (Corlu, Capraro and Capraro, 2014).

Studies show that in most of the schools, STEM disciplines are thought in a disjointed manner and so STEM cannot integrated in an effective way (Atkinson and Mayo, 2010) and also STEM education generally focuses on the science and mathematics disciplines by ignoring the engineering and technology while implementing integrated curriculums (McDonald,2016; English, 2015). However, in this digital world engineering and technological skills are also needed for future life (Hernandez et al., 2014). Namely, students should be educated based on these skills in order to adapt to future living conditions and to be successful in new business areas with the ability of assessing the problems based on different disciplines. At this point, STEM education has a crucial role in training technologically and scientifically literate individuals with reasoning and creative thinking skills, and with self-esteem (Uğraş and Genç, 2018). From this perspective, Wang at al. (2011) stated that “teachers in different STEM disciplines have different perceptions about STEM integration and that leads to different classroom practices” (Wang at al., 2011, pp.1). So, teacher education programs should focus on science, technology, engineering and mathematics disciplines together and teachers from different disciplines should work in a collaborative manner (Uğraş and Genç, 2018) in order to make the learning authentic. Brown, Brown and Merrill (2011) also introduce that teachers from different disciplines should collaborate and share their experiences on their expert area on a daily basis. In this way, the aims of STEM education can be also achieved in an effective way.
To get the opinions of teachers in different disciplines about STEM education is important to understand that how they structure different concepts in their minds in an individual and unified way. That is why; this present study aims to reveal the mind maps of pre-service teachers from different disciplines on STEM education in terms of the conception of each STEM areas individually and in an integrated manner.

All of these statements are required for a quality STEM education, but it is important that teachers are mentally ready for such an educational approach or not. One of the best ways to expose teachers’ mind maps is visuals and some studies were conducted by using visual materials to determine teachers’ perceptions on STEM education (Akaygün and Aslan-Tutak, 2016; Sümen and Çalışıcı, 2016). In the research of Akaygün and Aslan-Tutak (2016), they studied with pre-service chemistry and mathematics teachers and determined their conceptions by the posters prepared in groups before and after the implementation. In Sümen and Çalışıcı’s study (2016), STEM education activities were performed as part of an environmental education course with pre-service primary school teachers and their views were taken by mind maps. Both of the studies showed that pre-service teachers have a rich conceptual structure regarding STEM education and also associate STEM fields both with one another. On the other hand, in the literature, little attention is given on revealing the views or perceptions of pre-service teachers from different disciplines. Under the light of previous studies in the literature and definition of STEM education, this present study focused on mind maps of pre-service teachers from different disciplines (science and mathematics departments which are related with STEM disciplines).

**Conceptual framework**

In qualitative studies, researchers use some frameworks while analyzing research data to ensure the academic rigor and trustworthiness (Creswell, 2007; Denzin & Lincoln, 2008; Miles et al., 2014) and also to organize the condensed research results in a meaningful way. Moreover, the frameworks -theoretical or conceptual- also guide the study results to be more valuable, thought provoking, and resourceful for the other researchers.

In this manner, frameworks which are derived from related concepts ensure a logical structure for researchers while revealing themes or codes derived from study results (Savin-Baden and Howell Major, 2013) and helps researchers to determine the key points or concepts for their studies. From this perspective, STEM: Integrated Teaching (IT) Framework (Corlu, 2014, 2017; Corlu, Capraro & Capraro, 2014) guided this qualitative study as conceptual framework.

**STEM: Integrated Teaching (IT) framework**

STEM education is defined as an interdisciplinary approach that integrates at least two STEM the disciplines together according to their specific knowledge and skills and also it is shaped as a result of experiences of students and teachers (Corlu, Capraro & Capraro, 2014). In the light of this definition of STEM, STEM: Integrated Teaching (IT) Framework was constructed around four domains (Figure 1).
These domains from outer to inner layer are principles, social products, cognitive process and scope and sequences (Corlu, 2017). Firstly, the integrated teaching principles are determined as equity-relevance and interdisciplinarity-rigor. Equity-Relevance advocates that each student's interest and life experiences should be considered. Interdisciplinarity-rigor also focuses on making interdisciplinary applications without neglecting the specific knowledge and skills of main discipline (Aşık, Doğanca Küçük, Helvacı and Corlu, 2017).

As second domain, the social products include knowledge society, professional learning community, flexible curriculum in classroom, and theory and practices. According to this framework, knowledge society should not be limited to school environment. That is, when knowledge is applied outside of the school or in real-life conditions, knowledge society can be created. Beyond this, teachers are a part of professional learning community and so they should bring and place learning culture to their school. Also, teachers should make some investigations on STEM and should implement them in their lessons in collaboration with researchers or teachers. Finally, the curriculum should be flexible while applying STEM in classrooms, that is, it should be dynamic and open to change (Aşık, Doğanca Küçük, Helvacı and Corlu, 2017; Corlu, 2017).

The cognitive processes domain includes scientific inquiry, project-based learning, computational thinking, and mathematical modeling. These processes are related with the STEM disciplines (science, technology, engineering and mathematics) which create the last domain of the framework, scope and sequences.

Lastly, Authentic Problem of Knowledge Society (APKS) which is a type of information-oriented, open-ended problem is centered in the framework (Aşık, Doğanca Küçük, Helvacı and Corlu, 2017; Corlu, 2017).

From these perspectives, pre-service science and mathematics teachers’ STEM images or concept maps in their minds and interview were investigated based on STEM: Integrated Teaching (IT) Framework (Corlu, 2017) in order to reveal pre-service teachers’ mind maps on STEM education through STEM images.

**METHODOLOGY**

**Research design**

Case study design, one of the qualitative methods, was used in this research. Case study is a research methodology that investigates a phenomenon within its real-life context and provides an in-depth descriptive and exploratory analysis of individuals, groups or events to researchers (Yin, 2013).
This study is a descriptive and exploratory analysis of six pre-service teachers’ images about STEM Education in their minds. In the scope of the study, initially, both pre-service science and mathematics teachers were asked to visualize and draw images about STEM Education in their minds. After each pre-service teachers drew, researchers assessed the drawings. Then, focus group discussion was conducted with participants to collect in-depth data about pre-service teachers’ mind maps on STEM Education. The focus group discussion was guided by researchers with open-ended questions (Appendix A) and pre-service teachers’ deep understandings about STEM education were revealed.

**Research group**

The research group of current study consists of 6 pre-service teachers (3 pre-service science teachers and 3 pre-service mathematics teachers) who are 4th grade level students from a public university in Istanbul, Turkey. The sample was chosen from pre-service science and mathematics teachers who participated to ‘STEM Education Program’ during five months in STEM center. In this center, pre-service teachers gained knowledge and experiences about STEM Education as both theoretically and practically. They learned to design and implement the lesson based on STEM approach. Pre-service teachers participated in this research voluntarily.

**Data collection**

The data was collected in two steps after pre-service teachers participated to ‘STEM Education Program’ during five months in STEM center. In the first step of data collection process, pre-service science and mathematics teachers were asked for drawing about their STEM images in their minds and it took approximately 20 minutes. After researchers assessed pre-service teachers’ drawings, they prepared open-ended questions (Appendix A) and made focus group interview with pre-service teachers. The focus group discussion with six pre-service teachers took approximately 42 minutes. During discussion, researchers recorded pre-service teachers’ responses and dialogues with each other.

**Data analysis**

Pre-service teachers’ drawings about STEM education and transcribed discussions were assessed with thematic analysis through Integrated Teaching (IT) Framework which was constructed around four domains of STEM (Corlu, 2017). In data analysis process, codes were created based on the categories under the themes of IT Framework. The themes represents the domains of IT Framework and categories consist of principles in accordance with these themes. The determined codes from collected data were grouped for each principle and this analysis was approached in a deductive way (Creswell, 2007; Savin-Baden and Howell Major, 2013) which is a thematic analysis of data from predetermined framework (Frith and Gleeson, 2004). That is, according to the categories under themes of IT Framework, codes were determined from pre-service teachers’ drawings and views about STEM Education on transcript of focus group discussion.

**Results**

As a result of data analysis, 41 codes about pre-service teachers’ mind maps on STEM education were determined based on 14 categories under 5 themes of IT Framework. The whole research results in terms of themes, categories and codes were represented in table 1.
Table 1. Pre-service Teachers’ Mind Maps on STEM Education

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories</th>
<th>Codes</th>
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<tbody>
<tr>
<td>Authentic Problem for Knowledge Society (APKS)</td>
<td></td>
<td>- Real world relevance</td>
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<td></td>
<td></td>
<td>- Problem solving</td>
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<td>- Concretization</td>
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<td>- Presenting a purpose</td>
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<tr>
<td>Principles of STEM Education</td>
<td>Equity-Relevance</td>
<td>- Students’ learning ability</td>
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<td></td>
<td></td>
<td>- Multiple intelligence</td>
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<tr>
<td></td>
<td>Interdisciplinarity-Rigor</td>
<td>- Making connections among events</td>
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<tr>
<td></td>
<td></td>
<td>- Using multiple disciplines</td>
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<tr>
<td></td>
<td></td>
<td>- Using STEM as a tool</td>
</tr>
<tr>
<td>Social Products of STEM Education</td>
<td>Knowledge society</td>
<td>- Interpretation ability</td>
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<td></td>
<td></td>
<td>- Versatile growth</td>
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<td></td>
<td></td>
<td>- Qualified individuals</td>
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<tr>
<td></td>
<td>Professional learning community</td>
<td>- Interdepartmental meeting</td>
</tr>
<tr>
<td></td>
<td>Flexible curriculum</td>
<td>- Timing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Direction on curriculum about STEM implementation</td>
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<td>- Lack of application</td>
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<td>Cognitive Process in STEM</td>
<td>Scientific inquiry</td>
<td>- Higher order thinking</td>
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<td>Project based learning</td>
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<td>Mathematical modeling</td>
<td>- Tools (<em>Modeling, Concept maps, Experiments, Direct instruction, Asking questions</em>)</td>
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<td>- Human benefit (<em>digital world, robotics</em>)</td>
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<td>Scope and Sequences of Integrated Teaching</td>
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<td>Mathematics</td>
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DISCUSSION AND CONCLUSION

The aim of this study was to reveal pre-service science and mathematics teachers’ mind maps on STEM education through drawings and focus group discussion. In the light of this aim, 41 codes were determined under 14 categories which are derived from 5 themes (APKS, Principles of STEM, Social products, Cognitive process, Scope and sequences) of IT Framework (Table 1). In this part, determined codes from pre-service teachers’ drawings and quotations about STEM education in transcripts were discussed under each theme in detail.

The Theme of Authentic Problem for Knowledge Society (APKS)

Authentic Problem for Knowledge Society (APKS) is a type of problem which is related with real-life and also based on 21st century interests of students and teachers; and takes place in the center of STEM lessons. Also, it should be a well-defined problem which is focused on the 21st century dynamic and complex structure of life and also it should not direct the students to a single predetermined correct solution (Corlu, 2017). From this definition, four codes were determined from pre-service teachers’ drawings and views in interview. In some of the participants’ drawings (Figure 2 & Figure 3), it was seen that they placed the APKS at the center and one of them defined it as a lost key which means it should be found or solved.

Beyond this, during the interview some of the participants’ views on APKS are as the following:

PST2: “Starting point of STEM”

PMT1: “... APKS is a problem that I encounter in daily life, how do I create a solution.”

PST4: “...The most beautiful part of STEM is that it presents a problem to you, giving the child a purpose. So your goal is to solve this problem.”

PMT5: “...We had written a question about how to fit the luggage in the hangars of Turkish Airlines (THY), so we had done research on the internet, then the child used his mathematical skills and got a new knowledge and solved a problem. It's what we call an APKS.”

From these quotations, we can see that pre-service teachers related the APKS with real world problems that should be solved to reach a purpose. Beyond this, some of them thought that APKS is something that concretize the issues occurring around us: PST2: “...I think it's something we use to concretize, because children can imagine, but they find it difficult to perceive in a concrete way... In fact, this is an application we combine it in this way.” In the literature, the importance of problem
statement in STEM education was also stated (Aşık et al., 2017; Morrison, 2006; Bybee, 2010). As understood from its name, the problems should be also authentic to make connections with real-world situations (Herrington & Oliver, 2000; Aina, Aboyeji & Aboyeji, 2015). At this point, Mims (2003) stated that “Authentic learning is a pedagogical approach that allows students to explore, discuss, and meaningfully construct concepts and relationships in contexts that involve real-world problems and projects that are relevant to the learner” (Mims, 2003, p.2). That is why; in the light of the pre-service teachers’ views on APKS, the results related to the literature have emerged. That is, while implementing STEM lessons, a problem should be centered in this process to make more meaningful learning with a real-world related purpose. From these perspectives, four general codes were emerged for APKS domain: Real world relevance, problem solving, concretization and presenting a purpose.

**The Theme of Principles of STEM Education**

According to IT Framework, there are some principles that guide the teachers while implementing integrated teaching and also provide balance to them in their actions towards STEM. These principles are: Equity-Relevance and Interdisciplinarity-Rigor (Corlu, 2017). In the light of these themes, four codes were emerged from data. All of the participants stated and defined STEM as an interdisciplinary approach in both their drawings (Figure 4, 5 and 6) and the interviews. That is, they took all of the STEM disciplines in relation and also presented some examples for STEM and implementation process.
From these drawings, we can understand that participants know about the meaning of STEM which combines different disciplines within a concept and also during this process, they also aware of that students make some research, realize the situation and produce a product. In addition, during the interview, they stated STEM as a whole and also some problems on implementing STEM or what is STEM or not:

PST4: “You know how continents on the Earth are separated from each other by earthquakes or volcanic activities. It's like STEM. You know, like the parts of a whole, in fact, we take them apart, but in fact, it's all one. It [STEM] is building up a whole.”

PMT1: “I think we can't separate one from another. We use it somehow. Only in this class is a small group. But when we look at the whole, I think it is all in essence.”

Therefore, participants think that STEM can be taken as a whole and it cannot be separated within its disciplines. Also, they argue that they must be experts in their field or have a deep knowledge of their fields: PST2: “...I think this depends on the knowledge and creativity of the teacher.” At this point, it can be concluded that interdisciplinarity or using different disciplines together is important in STEM education but also teachers should have deep knowledge on their own subject area. Moreover, each student's interest and life experience should be considered as stated in IT Framework (Corlu, 2017) and participants also pointed this situation in their drawings and also interview: PST6 stated that “None of the individuals are equal, but they must have equal rights.” When we look at the PST6 drawing (Figure 7), it is seen that girls should be also included in STEM education especially on engineering discipline. At this point, in the literature, it is also stated that the lack of women in STEM fields has been an important issue (George-Jackson, 2011; Griffith, 2010; Shapiro & Williams, 2012; Owens et al., 2018; Yang & Gao, 2019).

Figure 7 Drawing of PST6 on STEM

From these results, participants think that students have multiple intelligence level and so each of them is unique and their learning abilities are different. But also they should have the same rights in their lives since they are a part of a knowledge society. So, STEM education should be given all students without separating them by learning levels or genders, because with the help of STEM education, they make connections between events they encounter in their daily lives and prepare themselves for their future by using their STEM knowledge and skills.

The Theme of Social Products of STEM Education

According to IT framework, there are social products of STEM education which are knowledge society, professional learning community, flexible curriculum and theory and practice (Corlu, 2017). When pre-service teachers’ drawings and interviews were assessed in these themes, 11
codes were determined in total. Drawings showed us that the participants were aware of that knowledge society is one of the products of STEM education. Pre-service teachers showed the knowledge society such as school environments in their drawings (See in Figure 3 and 4). Also, it is understood from the interview that they think that students create the knowledge society and in order to ensure qualified individuals, STEM education is needed by providing versatile growth of them. Some of pre-services’ opinions were given at below.

PMT1: “...after we give these skills to the students, what we actually raise is in the information society.”

PST4: “...More qualified individuals can grow. They can be individuals who can think and apply many things at the same time.”

In addition to knowledge society, pre-service teachers mentioned about professional learning community which were placed in IT Framework (Corlu, 2017). Wang, Moore, Roehrig and Park (2011) concluded in their research that the STEM integration professional development programs improve both teachers’ deeper understandings of the subjects they teach and integration of STEM disciplines. As it is understood from interviews, pre-service teachers also think that professional learning community is important part of STEM education. They especially emphasized that interdepartmental meetings contributes to acting together, effective communication and planning among different disciplines.

PMT1: “... Everyone does not good at every discipline. That is, some people good at mathematics, some people good at science, others good at different disciplines. With interdisciplinary studies, people get support from each other. For example, science teachers get support from mathematics teachers or vice versa.”

PMT3: “... People having professions about STEM disciplines like scientists, physicists, chemists, biologists, mathematicians, engineers forms of professional learning community.”

PST6: “... For example, when two teachers such as science and mathematics teachers come together and prepare activities together, they know what they do in their lessons better. Acting together is so important.”

Flexible curriculum is another important theme as stated in IT Framework (Corlu, 2017). During interviews, the participants underlined that the curriculum should be flexible. Timing, direction on curriculum about STEM implementation and flipped learning were emphasized by them. According to Corlu, Capraro and Capraro (2014), four STEM disciplines can be understood as interrelated formation by educators with integrated curriculum. From the interviews, it was understood that participants think that teachers consider four STEM disciplines separately and have difficulty in integrating these disciplines. However, pre-service teachers especially stated that teachers from different disciplines should study and plan the lessons together and integrate these disciplines thanks to flexible curriculum.

PMT1: “...Curriculum prepared by government should be because students prepare for exams but every school or teacher can change the place of subjects. For example, when science teachers teach friction, mathematics teachers can teach fractions at priorly or the same time. Relevant subjects can be taught simultaneously. The places of subjects can be changed flexibly.”

PMT3: “...Curriculum may offer options. That is, same subject, same content, same objectives but different activities, more creative, such as STEM based. Teachers can choose themselves. Curriculum can be more meaningful if it is like that.”
PST4: “...For saving of time, flipped learning can be applied. For instance, teachers want students to watch videos and get ready for activities at home. In this way, students can perceive faster and activities were done more quickly in the lessons.”

PST2: “...When I was in teaching practice, for example, when science teacher was going to teach circulatory system, she realized that students did not know respiratory system because there was not in new curriculum. However, if students do not know respiratory system, they cannot grasp circulatory system which includes the functions of lungs exactly. Therefore, she designed activity about respiratory system and then teach circulatory system. Teachers’ decision about the place of subject is so important.”

According to IT framework, theory and practice is another social product of STEM education. In this research, pre-service teachers mentioned about visualizing learning, readiness of teachers, lack of application and theory into practice. Corlu, Capraro and Capraro (2014) emphasized in their research that pre-service science and mathematics teachers should have more opportunities to practice for their profession in teacher education programs. Pre-services referred this issue in focus group discussion.

PST2: “...In our schools, there is a lot of theoretical knowledge in science and mathematics but experiments and practices are very few.

PST6: “...For example, students must be capable of mathematical computing of circuit design. They can do this in theoretically but can they design a new circuit in practice?”

PMT5: “... In theory, results cannot be seen concretely. However, when theory turns into practice, we can see what and how we do. For example, when we practice, we can observe how we can practice and realize the mistakes and solve problems or invent new things. In this way, we learn to cope with the difficulties.

The Theme of Cognitive Process

In this methodological integration called as integrated cognitive process methods, scientific inquiry in sciences, computational thinking in technology, project-based learning in engineering, and mathematical modeling in mathematics have been proposed. However, it should be kept in mind that teachers and students are expected to concentrate on knowledge and skills specific to their courses, not on these methods (Aşık et al., 2017). In this manner, pre-service teachers also stated various methods that can be used in STEM lessons such as modeling, concept maps, experimentation, direct instruction and asking questions. They also have drawn attention to the methods that rely on meaningful learning rather than memorization.

PMT5: “I think it provides higher order reasoning. That is, it's like having a system where the child can explain things in a really reasonable way. Maybe that's why it's not just memorization; it's like a comprehension-based thing.”

PMT3: “...different tools can be used to make something reasonable.”

Beyond this, some of the pre-service teachers also stated that STEM can be also a method in itself: PST2: “…and there's a perception like that STEM is a new teaching method.”

PST6: “Actually I think of it as something. We use STEM by combining other methods. So, it can be a teaching method in itself.”
At this point, it can be concluded that pre-service teachers have different views on the implementation methods of STEM education in the classroom setting. Uğraş and Genç (2018) found in their study that most adequate STEM education methods are the problem based approach, project based approach and engineering based approach in practice which are the most mentioned integrated methods in STEM education literature. Beyond this, participants also gave importance on the experience of teachers in the implementation process of STEM: PMT1: “In fact, we can choose a lot of methods. So, it depends on the teacher, you can integrate what you want.” Nathan and colleagues (2010) also found that successful integration of disciplines in the classroom depends on the attitudes and experience of teachers towards the STEM education. So, the results of this study are related with the literature on the cognitive process of STEM education. Also according to participants’ views, on the basis of cognitive process in STEM implementation, students’ higher order thinking, rationality and meaningful learning can be affected in a positive way.

**The Theme of Scope and Sequences of Integrated Teaching (Role of disciplines in STEM)**

STEM disciplines as Science, Technology, Engineering and Mathematics form the scope and sequences of integrated teaching. In the light of these disciplines, participants drawings and interview transcripts were analyzed and, for each discipline different codes were emerged (Table 1). For science discipline, participants relate it with physics, chemistry, biology, as natural science, in general. Beyond this, some of them expressed laboratory experiments, scientific argumentation and also understanding the natural world (see in Figure 5 and 6). American Association for the Advancement of Science (AAAS) (1990) defined some dimensions for science discipline: understanding natural world, scientific inquiry, and scientific enterprise. Dimension of understanding natural world represents that science is related with the natural world and defines the situations occur around us through knowledge gained by patterns in nature. Scientific inquiry dimension focuses on the methods that are used to understand the nature through collection and analysis of evidences. Finally, scientific enterprise dimension implies the performance of individuals while acting in institutional, social, and ethical aspects (AAAS, 1990). So, these dimensions also emerged as code for this study.

For technology discipline, some technological tools (microscope, computer, 3D writers), digital world, augmented reality emerged as codes. Technology broadly refers to “the tools created by human knowledge of how to combine resources to produce desired products, to solve problems, fulfill needs, or satisfy wants” (Koehler and Mishra, 2008, p.5). That is, technology can be used as a tool to solve the problems. In this manner, participants’ views and drawings on technology discipline focused on the devices for human benefits. In the same manner, engineering discipline was also related with some machines, prototype or designs and so these results show us that technology and engineering are effective in practice or application process in STEM education. One of the participants stated that PST4: “I think that science and math is the side of the problem that is interested in defining it. The application side is also the engineering and technology. I think we can classify it like that.”

Finally, mathematics was seen as a tool to understand the world or scientific phenomenon and requires analytical thinking while solving the problems. National Research Council (NRC) (1989) also defined the mathematics as “Mathematics reveals hidden patterns that help us understand the world around us. ...mathematics today is a diverse discipline that deals with data, measurements, and observations from science; with inference, deduction, and proof...” (p. 31). In the light of the data, participants’ views were also similar with this definition:

PMT1: “mathematics offers a language for you as well as technology for science, which I think is like an alphabet. But what is science is a discipline that explains what is
present in mathematics, something similar to what I see in technology, what I can do in
everyday life, what we can produce.”

PST4: “You also make it easier for a child to relate to the real world, for example when you do something related to math, or when you add something about science.”

Beyond taking disciplines individually, participants also related them with each other. That is, they believe that the interdisciplinary connections will help students to understand the topics covered, and provide permanent learning. In addition, seeing the practical uses of mathematics will also help students like mathematics more:

PST6: “The child says that I do not like math, because he cannot do theoretically in mathematics. But when they use mathematics in science, they can feel that they can do something with mathematics in reality.”

PMT5: “For example, the child loves to play with the Legos, and so, when you add mathematics to Legos with STEM, children may learn mathematics without noticing them.”

At this point, Corlu and colleagues (2014) also stated that mathematics used in science helps to contribute toward STEM education to be integrated. From this perspective and quotations, also drawings (Figure 2 & 6), interdisciplinarity was the common mentioned statement by participants for STEM education. That is, for this theme it was concluded that participants thought the discipline should be integrated with each other and also it is not necessary to combine all of them to be a STEM activity. So, participants have enough theoretical knowledge on STEM education but they do not know how to implement them in a classroom setting exactly. So, the role of each discipline is important for scope and sequences for integrated teaching.

REFERENCES


Corlu, M. S. (2014). FeTeMM eğitimi makale çağrısı mektubu [Call for STEM education research in the Turkish context]. *Turkish Journal of Education*, 3(1), 4-10.


Appendix A. STEM Focus Group Questions

1. What comes to your mind when ‘STEM Education’ is said?

2. Can you define STEM Education?

3. What do you think about the aims of STEM Education? What can be done to achieve these aims?

4. Why STEM Education is important at these days? What can be the causes to begin to use STEM Education? What are your opinions?

5. In your drawings, you referred ‘Authentic Problem of Knowledge Society (APKS)’ and integrated with STEM Education. What is ‘Authentic Problem of Knowledge Society (APKS)’? What is the place and importance of APKS in STEM Education?

6. What can you say about STEM (Science-Technology-Engineering-Mathematics) disciplines? Which teaching methods can be preferred while teaching these disciplines?

7. What do you think about the aims of teachers in STEM Education?
   a) What comes to your mind when it is said ‘Knowledge Society’? In STEM Education, who forms’ Knowledge Society’? Is it restricted with school?
   b) Who forms ‘Professional Learning Community’? What is the place and importance of this community at interdisciplinary teaching-learning process?
   c) What can be the effects of STEM Education in theory and practice?
   d) What kind of curriculum should be implemented in STEM Education?

8. What is ‘Equity-Relevance’ principle in STEM Education? Can you evaluate in terms of students?

9. Can you evaluate STEM Education in terms of ‘Interdisciplinarity’ principle? How the context among disciplines should be formed?

10. What can be the advantages and disadvantages of STEM Education for a short and long time?

11. Do you prefer STEM Education in your classes? Why?

12. In general, is there anything you want to add about STEM Education?
The Use of Canvas, A Learning Management System, to Reduce EFL Learners’ Public Speaking Anxiety

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Abstract

As traditional education has evolved with the Internet and technology, e-learning has shown rapid and significant growth. Many studies have emphasized the positive effects of technology and online resources in foreign and second language education. Because of its role in reducing foreign language anxiety, the use of digital technology has an important role in learners’ emotional healing. Therefore, the use of a digital platform, Canvas, and the exploration of its effects on learners’ public speaking anxiety and performance in L2 are the main research foci in this study. With this point of departure, in order to measure the effect of intervention related to the use of online speaking tasks and podcasts through Canvas, a one-group pretest-posttest was employed. Data regarding participants’ public speaking anxiety before and after the treatment were collected through the PRPSA (Personal Report of Public Speaking Anxiety) scale. Additionally, speaking rubrics were used as assessment tools for scoring learners’ pre and post oral performances. For more detailed information related to the participants’ learning experiences and changes in their emotional states, participants were encouraged to join online forums on Canvas. The results showed that the use of digital platforms and podcasts had a significant role in boosting learners’ confidence and public speaking performances through alleviating their anxiety.

Keywords: Canvas, Speaking Anxiety, Technology, E-Learning, Internet

DOI: 10.29329/ijpe.2022.467.20

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INTRODUCTION

Among other foreign language skills, speaking is one of the most ignored, challenging, and anxiety-provoking skills (Ansari, 2015; Horwitz et al., 1986; Savaş, 2014; Tanveer, 2007; Yee and Abidin, 2014). This is generally a two-layer problem that needs to be untangled with effective teacher-student collaboration. From teachers’ side, even though they are familiar with and constantly express their discomfort regarding students’ hesitation to speak, speaking skills are either avoided or blocked by teacher-centered activities and excessive teacher talk time. From the students’ side, concerning any speaking activities, most of them have the tendency of feeling uncomfortable and nervous, which prevents them from answering teacher questions, taking initiative role in starting interaction, or engaging in any interactive activities. For this reason, investigating the phenomenon of “speaking anxiety” plays an important role in foreign language education.

In the abstract, anxiety can be defined as “the subjective feeling of tension, apprehension, nervousness, and worry associated with an arousal of the automatic nervous system” (Spielberger, 1983, p. 111). According to the American Psychological Association (APA, 2021), anxiety is “an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure.” Despite moderate anxiety being necessary for survival, intense anxiety interferes with daily activities and may cause undesirable thoughts and behaviors. In respect of second and foreign language learning, anxiety has a debilitative effect on students’ performances (Horwitz et al., 1986; MacIntyre and Gardner, 1991; Tsiplakides and Keramida, 2009; Woodrow, 2006; Young, 1991). Speaking anxiety in second and foreign language learning contexts causes distress and concentration difficulties, which triggers students’ unwillingness to perform public speaking or participate in any conversation in a target language. Within these aspects, this paper investigated the concept of speech anxiety in a foreign language context and provided practical suggestions for overcoming it through web-based technologies. It also reported the findings obtained in the study seeking the impact of Canvas, a learning management system, on students’ oral performances in English.

LITERATURE REVIEW

Foreign Language Speaking Anxiety

In the general sense, anxiety can be divided into two aspects: state anxiety and trait anxiety. State anxiety refers to “psychological and physiological transient reactions” associated with negative situations (Leal et al., 2017, p.148). On the other hand, trait anxiety is about a fixed trait of personality (Leal et al., 2017; Woodrow, 2006). While state anxiety occurs in relation with specific situations, trait anxiety is a characteristic feature which arises on a regular daily basis (Kennedy et al., 2001). Pertaining to language learning, the mastery of a new language can be undermined due to the language anxiety since it may hinder learners’ language acquisition, retention, and production” process (MacIntyre& Gardner, 1991, p. 86). In general, foreign language anxiety can be classified under three constructs: a) communication apprehension, b) the fear of negative evaluation, and c) test anxiety (Horwitz et al., 1986, p. 127). According to Horwitz et al. (1986, p. 127), communication apprehension is an anxiety type which refers to “shyness characterized by a fear of or anxiety about communicating with people”. Individuals who have communication apprehension become less willing to use language orally or refuse to participate in conversations (Daly, 1991; Mejias et al., 1991). Regarding the fear of negative evaluation, students who have a fear of negative evaluation feel insecure and threatened by other people’s negative evaluations, and in order not to make any errors they do not participate in activities. Having low self-confidence and self-perceived academic competence, students feel embarrassed, inadequate, and inferior to their peers. Test anxiety refers to “the effects of anxiety on performance in test situations” (Spielberger et al., 2015, p. 318). If the test anxiety level interferes with the students’ performances or hinders their recalling of information, then it should be considered as negative anxiety.

In order to assess the degree of anxiety triggered by a foreign language, Horwitz et al. (1986) developed the Foreign Language Classroom Anxiety Scale (FLCAS). It relies on the individual’s own
report related to “the degree of anxiety, as evidenced by negative performance expectancies and social comparisons, psychophysiological symptoms, and avoidance behaviors” (Horwitz, 1986, p. 559). Three main anxiety types, communication apprehension, the fear of negative evaluation, and test anxiety, are highlighted in the scale with 34 items, and these items are given in specific situations which describe different anxiety-provoking situations that could be experienced by the students. According to Horwitz (1986), the use of the FLCAS could help teachers to collect data regarding the relation between their instructional methods and students’ anxiety, which consequently allows them to provide appropriate interventions for the situations that prompt anxiety.

**Technology and Language Development**

In recent years, a considerable amount of studies (Blake, 2008; Chapelle, 2001; Chun et al., 2016; Godwin-Jones, 2021; Ortega, 2017; Warschauer, 1996) have shown that the use of technology and the Internet facilitate and enhance the foreign and second language learning process. Through its purposeful use, it transforms passive learners into more active learners, helps all learners gain language skills, and supports them to have learning experiences beyond the classroom. Within its engaging and enjoyable atmosphere, it exposes learners to authentic language and increases their language and cultural awareness and knowledge. Moreover, through the use of different digital tools and platforms, practicing language could be more stimulating and influential for the learners. As stated by Kern (2014, p. 341), “Internet now brings the world of the Other to their desktop”. Nowadays, students do not have to travel abroad or live near native speakers; by taking advantage of modern technology they can talk with native speakers and connect with other language learners all over the world. With regard to language skills, the Internet provides different kinds of resources and applications for searching and sharing information, having online interaction, or collaborating with other people (Blake, 2016; Sharma and Barrett, 2007). Within a wide range of selections from online newspapers to blogs, students can practice and improve their reading skills and comprehension. In their study, Kalangi et al. (2019) found that internet browsing was effective in increasing students’ reading comprehension. In another study, Fattah (2016) shared the findings regarding the positive impact of using blogs, one of the important tools in Web 2.0, on university students’ reading skills and autonomy. Regarding instructors’ perspectives on technology use and L2 reading, the findings from Brantmeier’s study (2003) revealed that with related teacher training programs, teachers could overcome their anxiety related to technology use and develop more positive attitudes towards the use of CALL activities in L2 reading instruction.

Like reading skills, listening skills can also be developed and enhanced with the help of technological tools. In terms of accessing the audio materials of native speakers ranging from news to movies and live conversations, the use of the Internet and technology help learners to be exposed to a wide variety of speech at different speeds and in contexts (Meskill, 1996; Hayati and Mohmedi, 2011; Kavaliauskienë, 2008; Korkmaz and Güneyli, 2017). In respect of integrating information technology in developing listening skills, Naidionova and Ponomarenko (2018) shared their findings from their study which investigated the impact of podcasting technology on learners’ listening skills. They found that podcasting had an important role in improving students’ listening comprehension through supporting the language areas of grammar, vocabulary, and pronunciation. In parallel to this study’s findings, Meihami et al., (2013) and Lourdes and Gandhi (2019) also drew positive conclusions related to the integration of computer into listening activities. Additionally, Lourdes and Gandhi (2019) emphasized that the use of technology in their listening activities also reduced participants’ listening anxiety.

Current digital technologies have a significant impact on the students’ L2 writing, which is accepted as one of the most challenging language skills by language learners. With the right selection of technological tools, helping students to be equipped with fundamental skills and motivation required to be an effective writer in digital world is not difficult at all. The use of online educational tools such as mind mapping and graphic design programs for outlining and relating ideas, online dictionaries and corpora for having right word choices and checking meaningful contexts, plagiarism and grammar checkers for avoiding plagiarism and grammar mistakes, online writing labs and webs
for learning useful tips for effective writing support students’ writing. Concerning the effects of technology on writing skills, in their meta-analysis of the use of technology-based instruction in developing writing skills, Little et al. (2018) indicated that technology was closely connected with education and had a significant effect on writing. For the advantages of using information and communication technology in developing writing skills, based on their findings, Yunus et al. (2013) stated that technology attracted students’ attention and enhanced their learning process. According to Vurdien (2012), the use of personal blogs for writing enabled learners’ reflection on their learning and allowed them to get peer feedback and learn collaboratively, which in turn helped them to be more careful with their writing.

In addition to other skills, digital technology has an important place in developing speaking skills. Some studies (Huah and Jarret, 2014; Parveen, 2016; Stockwell, 2007) revealed that modern technologies such as the Internet, podcasts, websites, applications, videos, online translation and dictionary tools, and social media, etc. had significant effects on improving speaking skills. As indicated by Fitriani (2020), these tools not only help teachers to have “unlimited and up-to-date resources” but also increase learners’ involvement in the activities. In addition to building on the learners’ speaking skills regarding accuracy and fluency, the use of technology also boosts learners’ confidence and in turn reduces their anxiety and apprehension (Sosas, 2021). Additionally, according to the comprehensive review by Parveen (2016) and Stockwell (2007), educational technologies are “integral part” of the learning process in which the students can collect information and share them with their peers. In their action research study, Huah and Jarret (2016) explored the impact of the use of mobile phones and QR codes (quick response codes) on listening and speaking skills. They divided their participants into three groups as two groups of in-service teacher trainees and one group of secondary school teachers. Then, they asked the participants to create their own listening and speaking materials through recording their conversations on their phones, which makes their study different from other related studies. At the end of their study, they found that the methodology they employed increased the participants’ interests, motivation, and active participation. In another study, Lestari (2019) provided findings related to the integration of vlogs in developing students’ speaking skills. The data collected from 3 students of the Information and Technology Department showed that the use of video blogs played an important role in improving participants’ speaking skills and was effective in developing their knowledge about grammar, vocabulary, and culture. Regarding the relation between the web-based language learning and speaking anxiety, based on the findings of their mixed method research, Bashori et al. (2020) revealed that feeling anxious negatively affected students’ performances in speaking. They also indicated that students felt more comfortable speaking through learning websites than having in-person communication in which they physically could see one another. The studies conducted by Al-Abdali (2016) and Sevy-Biloon and Chroman (2019) suggested that the use of video chats had positive effects on the students with minimum opportunities to practice English outside. They found that video chatting let students have more positive feelings and inherent satisfaction about their speaking performances as they provided communication channels in a more relaxing environment.

Despite the new technological advances and their importance in promoting language development, the integration of digital resources into teaching speaking needs more research to further understand the role of technology in helping learners to overcome their speaking anxiety in public. Within this respect, this study aims to answer the following questions:

1. What impact does the use of Canvas, a Learning Management System, have on EFL learners’ public speaking anxiety?

2. Is there any significant change in the participants’ speaking proficiency after the intervention?

3. What are the participants’ reported learning experiences related to the use of Canvas in theirspeaking tasks and public performances?
METHOD

Research Design

The present study employs one-group pretest-posttest design in which the impact of the use of Canvas on the participants’ speaking anxiety levels was measured once before and once after an 8-week intervention. With the purpose of collecting a wide range of data, both quantitative and qualitative related to research focus, a mixed methods research design was conducted. During the treatment, participants were first informed about the learning management system. Then, they were assigned with discussion topics around different themes. In this process, they were also provided with essential words and expressions important for their discussions. In order to collect the quantitative data, they were asked to complete the PRPSA (Personal Report of Public Speaking Anxiety) scale as a pre and post-test. As for the qualitative data, students’ podcasts related to online discussions, their comments to their peers’ posts, and the reflection papers they wrote on their experiences were used.

Participants

The participants in this study were 15 English foreign language learners, and at the time of the data collection, they were attending courses designed around EGP (English for General Purposes). The population of the present study was undergraduate ELT students studying at a public university. They were between the ages of 18-24. Through integrated skills courses, learners were equipped with necessary language skills of reading, listening, speaking, and writing. In order not to cause any breach of confidentiality, data was held anonymously.

Data Collection Procedures and Tools

The study involved three parts for the data collection. The first part of the data collection was based on the scores students got from their speaking tasks before and after the intervention. The second section of the data gathering process was carried out through the use of Personal Report of Public Speaking Anxiety (PRPSA) scale (McCroskey, 1970). The scale consists of 34 item scale designed for the purpose of measuring anxiety related to public speaking and the reliability of the scale was estimated as .94. A 5-point Likert scale was adapted for each item ranging from “strongly disagree” to “strongly agree”. With the aim of measuring the impact of Canvas on the learners’ anxiety level, participants were asked to complete the scale both before and after the use of the application. In the last part of the data collection, learners were asked to share their opinions related to the use of Canvas for their speaking tasks and regarding its effects on their speaking skills and anxiety levels through online forums (see Figure 1 & 2). These reflections were used to triangulate the data in order to gain more insights into students’ learning experiences.
During the intervention, students were given different types of speaking tasks for their public presentations. These tasks aimed to support students to improve confidence and build fluency in their public speaking. During the preparation and rehearsal time, students were given enough time to collect language samples and learn new vocabularies and expressions related to their speaking topics. Additionally, during this time they could also check their pronunciation and listen to their friends’ podcasts.

For their speaking tasks, students not only shared their recordings but also made a short list of vocabularies and expressions that they used in their performances and shared it with their podcasts for the purpose of input-enhancement for other students (see Figure 3).
As a feature of Canvas, students were also able to embed direct link or images into their comment boxes. By this way, they had the opportunity of supporting their talk with visuals and other resources.

The Data Analysis

IBM SPSS Statistics 25 (Statistical Package for Social Package for Social Sciences) was used to statistically analyze the quantitative data. In addition to the descriptive statistics such as frequency rates and means, Wilcoxon-Signed Rank tests were carried out in order to see the difference between the pre and post measurements of the participants regarding speaking anxiety levels and oral performances. For the participants’ overall scores on the PRPSA (Personal Report of Public Speaking Anxiety), the formula provided by the official site (http://www.jamesmccroskey.com/measures/prpsa.htm) of the survey (McCroskey, 1970) was applied. Based on the PRPSA data, the scores related to their public speaking anxiety were calculated in accordance with the steps suggested by the scale (McCroskey, 1970): “Step 1. Add scores for items 1, 2, 3, 5, 9, 10, 13, 14, 19, 20, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32, 33, and 34; Step 2. Add the scores for items 4, 6, 7, 8, 11, 12, 15, 16, 17, 18, 24, and 26; Step 3. Complete the following formula: PRPSA = 72 - Total from Step 2 + Total from Step 1”. With the aim of improving the reliability of the speaking scores, participants’ oral performances were assessed through the use of rubrics. Accuracy, fluency, vocabulary, and specific vocabulary items & expressions were determined as assessment criteria, and each language aspect was assessed within a 5-point scale. With the purpose of enhancing the interpretation of the data related to participants’ learning experiences and emotional regulation, through an online forum, participants were asked to reflect on the intervention process and its effects on the development of their speaking skills and reduction of their speaking anxiety. Then, the gathered data were analyzed in accordance with the research patterns and themes. Even though this study did not turn a blind eye to any emergent data-driven themes, a deductive approach enriched with the targeted reflection questions was employed in order to encourage participants to reflect on some predetermined themes like the impact of Canvas on their language development and anxiety treatment.

FINDINGS

The results indicated that the use of the Canvas Learning Management System for developing the participants’ oral performance in English through minimizing their anxiety level in speaking tasks and discussions had a positive impact both on their public speaking abilities and language development. With the aim of examining the change in learners’ anxiety level and its effect on their presentation skills, participants were tested before and after the intervention. In addition to the
quantitative tools for the statistical analysis, participants were also interviewed in order to obtain in depth information about their opinions and feelings about the application.

Table 1: Personal Reports of Public Speaking Anxiety Level Pre & Post Intervention (the Use of Canvas)

<table>
<thead>
<tr>
<th>Participants</th>
<th>Pre Anxiety Score</th>
<th>Category</th>
<th>Post Anxiety Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>H (High)=131</td>
<td>M (Moderate)=98-131</td>
<td>L (Low)&lt;98</td>
</tr>
<tr>
<td>1</td>
<td>107</td>
<td>M</td>
<td>86</td>
<td>L</td>
</tr>
<tr>
<td>2</td>
<td>109</td>
<td>M</td>
<td>103</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>117</td>
<td>M</td>
<td>79</td>
<td>L</td>
</tr>
<tr>
<td>4</td>
<td>93</td>
<td>L</td>
<td>84</td>
<td>L</td>
</tr>
<tr>
<td>5</td>
<td>124</td>
<td>M</td>
<td>97</td>
<td>L</td>
</tr>
<tr>
<td>6</td>
<td>138</td>
<td>H</td>
<td>122</td>
<td>M</td>
</tr>
<tr>
<td>7</td>
<td>134</td>
<td>H</td>
<td>69</td>
<td>L</td>
</tr>
<tr>
<td>8</td>
<td>94</td>
<td>L</td>
<td>81</td>
<td>L</td>
</tr>
<tr>
<td>9</td>
<td>116</td>
<td>M</td>
<td>88</td>
<td>L</td>
</tr>
<tr>
<td>10</td>
<td>87</td>
<td>L</td>
<td>71</td>
<td>L</td>
</tr>
<tr>
<td>11</td>
<td>136</td>
<td>H</td>
<td>67</td>
<td>L</td>
</tr>
<tr>
<td>12</td>
<td>96</td>
<td>L</td>
<td>53</td>
<td>L</td>
</tr>
<tr>
<td>13</td>
<td>139</td>
<td>H</td>
<td>124</td>
<td>M</td>
</tr>
<tr>
<td>14</td>
<td>127</td>
<td>M</td>
<td>75</td>
<td>L</td>
</tr>
<tr>
<td>15</td>
<td>117</td>
<td>M</td>
<td>91</td>
<td>L</td>
</tr>
</tbody>
</table>

Table 1 shows the overall change in the participants’ speaking anxiety levels before and after the use of Canvas in their speaking course. It can be concluded from the data that recording podcasts for speaking tasks, sharing these podcasts online, and exchanging comments with their peers had a positive effect on all students in terms of reducing their anxiety levels.

Table 2: The Statistical Data related to the PRPSA Pretest & Posttest Scores

Participants’ pre and post communication apprehension levels were determined through their responses to the 34 items of PRPSA. The scores related to the learners’ speaking anxiety levels were grouped under three main categories as low (L), moderate (M), and high (H). The results presented in Table 2 show that as for the pretest analysis of public speaking anxiety levels, those of 4 learners were high; those of 7 of them were moderate, and those of 4 of them were low. As for the posttest analysis, the categories of level of speaking anxiety changed as 3 moderate and 12 low. In the statistical sense,
it can be seen that the anxiety levels of all participants decreased and changed positively. Regarding categorization, except for 5 learners, the rest of the samples reported to have less anxiety after the integration of Canvas into their speaking course. 2 participants’ anxiety levels changed from high to low levels, and 8 participants indicated that the categories of their anxiety levels shifted into a lower one during their presentations.

### Table 3: The PRPSA Item Analysis

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre Mean</th>
<th>Post Mean</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. While preparing for giving a speech, I feel tense and nervous.</td>
<td>61</td>
<td>37</td>
<td>24</td>
</tr>
<tr>
<td>11. I feel relaxed while giving a speech.</td>
<td>56</td>
<td>38</td>
<td>18</td>
</tr>
<tr>
<td>20. My heart beats very fast just as I start a speech.</td>
<td>58</td>
<td>36</td>
<td>22</td>
</tr>
<tr>
<td>22. Certain parts of my body feel very tense and rigid while giving a speech.</td>
<td>54</td>
<td>34</td>
<td>20</td>
</tr>
<tr>
<td>34. While giving a speech, I get so nervous that I forget facts I really know.</td>
<td>56</td>
<td>37</td>
<td>19</td>
</tr>
</tbody>
</table>

Table 3 presents the pre and post mean scores of the scale items, which shows that participants reported more improvement in their public speaking anxiety level. Based on these items, it can be inferred that participants feel less anxious and stressed while preparing and giving a speech after the intervention. Additionally, they also indicated that regarding remembering the facts and details related to their speech, their speaking anxiety influenced their oral performance less than that in the pre-intervention.

### Table 4: The Wilcoxon Signed-Ranks Test Analysis for Pre and Post Public Speaking Anxiety Levels within the Samples

<table>
<thead>
<tr>
<th>Pre&amp; Post Public Speaking Anxiety Results</th>
<th>N</th>
<th>Mean rank</th>
<th>Sum of ranks</th>
<th>Z score</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
<td>8.00</td>
<td>120.00</td>
<td>-3.408</td>
<td>.001</td>
</tr>
</tbody>
</table>

Table 4: The Wilcoxon Signed-Ranks Test Analysis for Pre and Post Public Speaking Anxiety Levels within the Samples

As shown in Table 4, the Wilcoxon Signed-Ranks Test indicated that there was a significant reduction in the participants’ levels of public speaking anxiety after the use of Canvas for their speaking tasks and presentations (Z=-3.408, p=.001).

### Table 5: The Pre and Post Scores related to the Participants’ Oral Performances

<table>
<thead>
<tr>
<th>Pre-Scores</th>
<th>Post-Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>82</td>
</tr>
<tr>
<td>72</td>
<td>86</td>
</tr>
<tr>
<td>73</td>
<td>89</td>
</tr>
<tr>
<td>71</td>
<td>93</td>
</tr>
<tr>
<td>65</td>
<td>66</td>
</tr>
<tr>
<td>78</td>
<td>86</td>
</tr>
<tr>
<td>81</td>
<td>86</td>
</tr>
<tr>
<td>79</td>
<td>91</td>
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<tr>
<td>90</td>
<td>93</td>
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<tr>
<td>87</td>
<td>88</td>
</tr>
<tr>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>81</td>
<td>77</td>
</tr>
<tr>
<td>76</td>
<td>81</td>
</tr>
</tbody>
</table>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
During the intervention, through online discussions and presentations, participants were encouraged to manage their public speaking anxiety. While working on the digital platform, participants also could make and get comments related to the presentations. Making quantitative sense related to the participants’ oral performances, Table 5 shows an increase in all post speaking scores.

Table 6: The Wilcoxon Signed-Ranks Test Analysis for Pre and Post Speaking Scores

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean rank</th>
<th>Sum of ranks</th>
<th>Z score</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre &amp; Post Speaking Scores</td>
<td>15</td>
<td>8.00</td>
<td>120.00</td>
<td>-3.413</td>
<td>.001</td>
</tr>
</tbody>
</table>

b: Based on negative ranks

Based on the analysis of the Wilcoxon Signed-Ranks Test, it was recorded that there was a significant increase between the pre and post speaking scores ($Z=-3.413$, p=.001).

Table 7: Participants’ Reflections on the Effects of Canvas on their Language Development

<table>
<thead>
<tr>
<th>Participant</th>
<th>Reflection</th>
<th>Learning new vocabulary and developing pronunciation skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>“I’ve learned so many words that I’ve never known before by listening to my friends’ recordings, and by recording and listening to my podcasts I tried to correct my pronunciation mistakes.”</td>
<td></td>
</tr>
<tr>
<td>Participant 2</td>
<td>“On Canvas listening to others’ thoughts gives the person the chance of hearing different ideas, and you can also learn new vocabulary and idioms.”</td>
<td></td>
</tr>
<tr>
<td>Participant 4</td>
<td>“I believe that my pronunciation skills have been developing, and I’m getting better.”</td>
<td></td>
</tr>
<tr>
<td>Participant 5</td>
<td>“I mostly care about people’s comments about my speaking and pronunciation.”</td>
<td></td>
</tr>
</tbody>
</table>

Improving English (Learning new vocabulary and developing pronunciation skills)

It is a common phenomenon for most of the people to feel nervous while speaking or presenting in front of other people. This not only has a negative impact on individuals’ affective state but also shows itself physically like having a stomach ache, sweating, rapid breathing, or having an irregular heartbeat, etc. Speaking English or teaching English require good presentation and speaking skills. For this reason, Canvas was designed to provide digital resources and a platform on which learners could specifically focus on communication and practice their public speaking skills without feeling the actual presence of other people which made them feel anxious. In this sense, through online discussions, participants were prepared for real-world experiences in a digital classroom which was less anxiety-provoking. In parallel to this purpose, as shown in Table 7, participants reported positive outcomes regarding improving their English and concerning building better public speaking skills.

Table 8: The Participants’ Opinions related to the Change in their Speaking Skills and Anxiety

<table>
<thead>
<tr>
<th>Participant</th>
<th>Reflection</th>
<th>Changes in their Speaking Skills and Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 3</td>
<td>“Through Canvas, I recognized that giving a presentation was not difficult at all. Previously, I was nervous while recording my voice; I am not still totally relaxed during recording my podcast, but it is better.”</td>
<td></td>
</tr>
<tr>
<td>Participant 6</td>
<td>“Because of the shutdown, we could not socialize with people at all. So, having online discussions with our friends is really nice. I must admit that Canvas increased my confidence pretty much. I used to be so shy to even record my voice but now I don’t have any trouble with that.”</td>
<td></td>
</tr>
<tr>
<td>Participant 7</td>
<td>“Most importantly, before this experience I could not speak properly because of my anxiety; but now, I can speak with less doubt. I’ve never used a platform like Canvas before so I’m so glad that I experienced that.”</td>
<td></td>
</tr>
<tr>
<td>Participant 8</td>
<td>“I was too excited to speak English even on the phone. I think my first podcasts were terrible...anyway that’s why I think Canvas helped me a lot.”</td>
<td></td>
</tr>
<tr>
<td>Participant 9</td>
<td>“No matter how prepared I was, I got nervous and excited to talk in public. Canvas was very useful...I recognize that there is a general progress and that our voices are more confident. Listening to the podcasts makes me feel that I am in the class.”</td>
<td></td>
</tr>
<tr>
<td>Participant 12</td>
<td>“I had butterflies in my stomach while speaking in public- you know it’s difficult to express yourself-, but thanks to Canvas, I started to speak more confidently. I think I beatmy excitement and this is one of the most important things that Canvas provided me.”</td>
<td></td>
</tr>
</tbody>
</table>
As in Table 8, learners also stated that they experienced positive changes in their emotional state. They indicated that using Canvas helped them to ease their anxiety and make them feel more confident while speaking and presenting in English.

**DISCUSSION AND CONCLUSIONS**

Digital tools have been regarded as practical ways to build communication skills. Online educational resources and platforms provide learners with a number of language learning opportunities like collaborative and experiential learning. While students enjoy learning from each other, they can also be encouraged to be part of autonomous and discovery learning processes in which they search, explore, and build their own learning. As suggested by Mohammadi et al. (2011) and Aydin (2018) and as also confirmed by the findings of this research study, it can be emphasized that online learning facilitates student engagement and sparks students’ interest and motivation. Another main advantage which primarily concerns this study is its effects on students’ psychological restoration. Positively addressing learners’ emotional barriers through online assignments and discussions, online resources and learning boost student confidence and motivation and help them take an active role in their language learning (Hamzaoğlu and Koçoğlu, 2016; İler, 2009; Stockwell, 2013; Stockwell and Reinders, 2019). Participating in online activities through disguising themselves with online presence allows learners to perform language skills in a non-threatening atmosphere being less haunted with the real presences of their teacher and peers. Based on their learning experiences, students admitted that using Canvas for their online discussions maintained their emotional wellbeing through relieving their stress and anxiety, which in turn let them build more self-esteem and speak more confidently. Regarding the positive effects of web-based learning on reducing students’ speaking anxiety, in the lights of the findings they collected through interviews with Indonesian vocational high school students, Bashori et al. (2020) indicated that participants reported that web-based learning had positive changes in their speaking anxiety.

Additionally, according to Wang and Zhang (2021), through organizing group works and varying activities and tests, the teacher can enhance the quality of students’ online learning and alleviate students’ foreign language anxiety. With a special reference to this point, in order to successfully complete their online tasks, gather information, learn essential words, and expressions that could help them express themselves clearly, participants were encouraged and guided to use online resources and search engines. Reflecting on their online learning experiences, students stated that there was an obvious change in their using internet and digital tools. They admitted that they were more conscious and digitally literate about making the best use of internet for their language learning. Moreover, they reported that they became more critical in managing their digital time and content in order to access more reliable and accurate information and use time more productively being less affected by digital distractions.

Providing and receiving digital feedbacks from the teacher and peers are other aspects highly emphasized by the participants as they boosted their engagement and enhanced their development in speaking. With regard to the implementation of feedback, due to the constraints of having many students and limited time, students can get more frequent and ongoing feedback from their peers than the teacher. According to VanGeel and Luttikhuis (2020), through peer feedbacks and getting the roles of both assessee and assessor, learning process also can be enhanced. Concerning the digital feedbacks participants got from their peers for their podcasts, they indicated that they felt intellectually and emotionally more stimulated while doing their digital tasks. With their peers’ feedback, students indicated that they felt more appreciated and motivated, which increased their willingness to participate in discussions and to communicate.

It needs to be realized that most of the language learners perceive speaking skill as the most anxiety-provoking skills in foreign language. In this sense, if we consider its negative effects on the students’ wellbeing and performances, it is essential to emphasize that language teachers should be sensitive to the phenomenon of speaking anxiety and provide help to reduce students’ anxiety in speaking. This study provided findings related to the positive effects of the integration of an online
platform, Canvas, and podcasting on the students’ public speaking anxiety. For further investigation, researchers could deeply study the causes of speaking anxiety and investigate the learning strategies and skills essential for the learners to reduce their anxiety during oral performances. In addition to these research foci, scholars could also explore the notion of web-based autonomous English learning and suggest online resources that learners could exploit to overcome their speaking anxiety. Due to the limited access to the larger sample size and not to put any students into a disadvantaged position as the intervention was carried out as a part of a regular speaking course, a one-group pretest-posttest design was utilized. Therefore, the lack of any control group in order to confirm the recorded and observed effect of the intervention was the main limitation of this study. However, through the use of multiple methods and data triangulation, the drawbacks of a single group pretest-posttest design were minimized.

REFERENCES

Al-Abdali, A.I (2016). The role of online Internet cam chat in providing EFL freshmen with opportunities to interact with the target language community as an authentic environment to develop communicative language skills. *British Journal of English Linguistics*, 4(4), 46-59.


