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# The Effect of Mind and Intelligence Games on the Creative Problem-Solving Skills of Primary School 4th-Grade Students

*Research Article*

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ABSTRACT

This study aims to investigate the impact of learning activities based on mind and intelligence games (MIG) on the creative problem-solving abilities of primary school 4th-grade students. The study used a quasi-experimental pretest-posttest control group design. The research study group comprised fourth-grade students from an Istanbul public primary school. The study group included 75 primary school students, 39 in the experimental group and 36 in the control group, as determined by the random group sampling method. Data for the study were gathered using the creative problem-solving scale. According to the study, mind and intelligence games positively affected primary school students' creative problem-solving skills.



**Keywords:**
Mind and Intelligence Games, Creative Thinking, Problem Solving, Creative Problem Solving

## Introduction

Rapid advancements in science and technology in the modern era have significantly impacted the social, economic, and political spheres. In order to follow and keep up with the quick changes in every industry, it is essential to consider raising people with a sustainable worldview and productive, innovative, problem-solving, and creative skills. Problem-solving creativity, which serves as the foundation for other essential skills, is unquestionably one of the fundamental abilities that these people should possess. Because the ability to produce unusual, original, and different solutions to problems, as well as seeing that there can be more than

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one answer to a question and being able to produce alternative answers, forms the foundation for the individual to produce surplus value both for his/her own life and for society (MEB, 2013).

Thinking beyond the box, controlling one's thoughts, resolving issues, coming up with novel solutions , getting varied results, being able to think in multiple ways, and being conscious of one's surroundings are j ust a few examples of how creativity is defined (Maker, Jo, & Muammar, 2008; Sousa, Ileana, Walton, & Pissa rra, 2013; Hildebrand, 1991; Mayosky, 1995). Problem-solving, conversely, can be defined as selecting the appropriate action to achieve a goal and developing solutions to difficulties encountered along the way (Evans, 1991). There are several stages to the problem-solving process. These stages are defined as defining the problem, explaining the problem, collecting relevant data, distinguishing the data to be used in the solution, producing different solutions, selecting and applying the most appropriate solution, and evaluating the result obtained (Bingham, 2004). According to research, problem-based learning improves students' creative thinking skills (Kashani-Vahid, Afrooz, Shokoohi-Yekta, Kharrazi & Ghobari, 2017). At this point, problem-solving is a creative process (Butcher & Niec, 2005; Tyagi, 2015; Ward & Finke, 1995). Research on creative thinking and problem-solving skills has grown in recent years.

Creative problem-solving can be defined as focusing on the solution by thinking creatively, analytically, and critically, without relying on problem-solving steps to solve a practical problem encountered in daily life. In other words, when solving a problem, the goal is not to perform the predetermined operations in the correct order but to discover and test alternative approaches. Furthermore, individuals must redefine the problems they encounter, present new ideas, and act on them during creative problem-solving (Özkök, 2005; Toraman, 2017; Lumsdaine, 1995). In this context, problem-solving can be defined as a skill that needs creative thinking, critical-analytical thinking, and other high-level thinking abilities. Recognizing the problem is the first step in problem-solving solving. Other sub-skills include gathering information, formulating hypotheses, expert developing ideas, and developing concepts. This skill necessitates the scientific science process skills, a shift in perspective on the problem, and the use of creativity throughout all of these processes (Carmeli, Gelbard, & Reiter Palmon, 2013; Basadur, Graen, & Wakabayashi, 1990; Pannells, 2010; Puccio, 1999).

Although there are no set boundaries or sequences for creative problem solving, it consists of six stages: mess finding, data finding, problem finding, idea finding, solution finding, and acceptance finding (Vidal, 2010; Treffinger & Isaksen, 2005). Creative problem-solving skills can be developed in the classroom by putting students in situations where they must develop original and creative solutions to everyday problems. Techniques such as brainstorming, thinking with six hats, and simulation can be used to improve the creative problem-solving process. Furthermore, learning materials that engage children can be preferred. MIG, primarily used to develop children's problem-solving and creative thinking skills, can be used to teach and develop creative problem-solving skills. Using MIG in educational settings can help students gain creative problem-solving skills by allowing them to think creatively and authentically or to practice their ideas (Bottino & Ott, 2006).

Today, especially with the increased use of the game in the classroom, MIG is frequently used as part of the process or in a separate class hour. MEB (2013) defines MIG as tools that enable students to recognize and develop their intellectual potential, to develop different and original problem-solving strategies, to make quick and correct decisions, to develop skills to work individually, as a team, and in a competitive environment and to develop a positive attitude toward problem-solving. For example, intelligence games, such as intelligence questions, strategy games, reasoning and operation games, verbal games, and geometric-mechanical skills, help students develop reasoning, higher-order thinking, problem-solving, creativity, and algorithmic thinking (Marangoz & Demirtaş, 2017). In addition, these games require various strategies, such as problem-solving and logical thinking skills, and improve cognitive functions (Muller & Perlmutter, 1985; Ott ve Pozzi, 2012).

MIG addresses real-life issues and encourages the player to think and research. These games improve reasoning and problem-solving abilities. Furthermore, MIG can be used to develop fundamental skills such as critical thinking, creative thinking, creative problem solving, and strategic thinking (Devecioğlu & Karada, 2014; Baki, 2018; Demirel, 2015; Carpenter, 2018; Facione, 1990; Dziedziewicz, Gajda, & Karwowski, 2014; Leikin, 2009; Kirriemuir & Mcfarlane, 2004; Bottino et al., 2013; Bottino & Ott, 2006; Yöndemli & Taş, 2018). The group games included in the MIG content have the potential to increase student's social skills and self-confidence, as well as social skills such as perseverance in the face of failure. Mind and intelligence games, in addition to the benefits listed above, can be said to be beneficial in achieving practical goals such as increasing learning, motivation, focusing, and attention (Rosas et al., 2003; Garris, Ahlers & Driskell, 2002; Lou, Abrami, D'Apollonia, 2001).

### Purpose of the Research

This research examines the effects of educational activities prepared with MIG on the creative problem-solving skills of primary school 4th-grade students.

## Methodology

### Model of the Research

The pretest-posttest control group quasi-experimental design was used for this study. When accurate experimental models cannot be used, quasi-experimental models are used. There is an experiment with an independent variable (MIG activities) and a control group with no independent variable in the quasi-experimental design, which includes the experimental and control groups. However, in the quasi-experimental design, the students in the experimental and control groups cannot be determined randomly; because the study is conducted in a classroom setting, the groups are assigned as experimental and control groups at random. In such studies, the absence of a significant difference in pretest scores between experimental and control groups can be interpreted as equal before the application. Table 1 depicts a symbolic representation of the quasi-experimental research design used in the study.

**Tablo 1.** The experimental design used in the research

| Working Groups | Assignment to Group | Pre-Test | Applied Activities | Post Test |
|---|---|---|---|---|
| **Experimental Group** | R | Creative Problem-Solving Scale | MIG Activities | Creative Problem-Solving Scale |
| **Control Group** | R | Creative Problem-Solving Scale | Non-Applied Group | Creative Problem-Solving Scale |

### Study Group

The research population consists of students in the fourth grade at a public primary school in Istanbul's Esenler district, located in a low-income neighborhood. The study group consists of 75 students who attend classes in two branches chosen from this universe using a random group sampling method. Furthermore, the experimental group in which the applications were made and the control group in which the results were checked were chosen randomly. Table 2 provides detailed demographic data for the study group.

**Tablo 2.** Demographic information of the experimental and control groups

| Demographic Variables | Demographic Information | Control Group | | Experimental Group | |
|---|---|---|---|---|---|
| | | % | f | % | f |
| Gender | Gril | 47,22 | 17 | 53.84 | 21 |
| | Boy | 52.77 | 19 | 46.15 | 18 |
| | **Total** | 100 | 36 | 100 | 39 |
| | 0-4500 ₺ | 33.33 | 12 | 23.07 | 9 |

| | | | | | |
|---|---|---|---|---|---|
| Socio-Economic Status | 4501-6000 ₺ | 47.22 | 17 | 38.46 | 15 |
| | 6001-8000 ₺ | 13.88 | 5 | 30.76 | 12 |
| | 8001 + ₺ | 2.77 | 1 | 5.12 | 2 |
| | **Total** | 100 | 36 | 100 | 39 |

As seen in Table 2., the control group consists of 17 girls and 19 boys, while the experimental group consists of 21 girls and 18 boys. The children of lower-income families make up most of these students' families (98% in the control group and 95% in the experimental group).

**Data Collection Tools**

**Creative Problem-Solving Scale**

The scale was developed by Lin (2010) to gauge students' capacity for creativity problem-solving. The measure has 49 items and five factors—convergent thinking, divergent thinking, motivation, environment, general knowledge, and skills—and is a 5-point Likert type. After performing Confirmatory Factor Analysis (CFA) and reliability coefficient Cronbach it was discovered that the scale had the same five factors as the original scale. The creative problem-solving scale was adapted to Turkish by Bulut et al. (2018). The scale adapted to Turkish consists of 40 items. Information showing the consistency of the scale determined by confirmatory factor analysis, respectively; $\chi 2 = 2028$ (sd = 730), RMSEA = 0.046 [.043, .048], CFI=.929, TLI=.924. can be sorted. In addition, confirmatory factor analysis was conducted with 200 students regarding the scale's suitability for primary school 4th-grade students. The data obtained shows that ($\chi 2 = 2.60$, RMSEA = 0.0489, CFI= .903) the scale can be applied to primary school 4th-grade students.

**Data Collection Process**

Before the applications, the creative problem-solving scale was administered to students in the control and experimental groups, and pre-test data were collected. For eight weeks, the students were subjected to the prepared MIG activities. The games were played in the MIG laboratory under the supervision of 5 educators who are well-versed in MIG. The educators played with the children in pairs or mutually at each station. Students were free to play with whomever they wanted. Throughout the applications, the classroom teacher was present in the MIG laboratory. The implementation of mind and intelligence games is based on the MIG curriculum established by the Ministry of National Education. MIG was played in six different categories during the applications. Table 3 displays the activities performed during the application as modules.

**Tablo 3.** MIG training weekly application stages

| **Weeks** | | **Activities** |
|---|---|---|
| 1.Week | MIG general introduction | Each week, the students were told what they needed to do. MIGs were developed in collaboration with the students. Parent and teacher interviews were conducted to ensure students actively participated in the training. |
| 2.Week | Intelligence questions | Liar-True, measuring cups, Match problems, Finding the following terms |
| 3.Week | Strategy games | Chess, Reversi, Mangala, Number guessing |
| 4.Week | Reasoning and Operation Games | Sudoku, Logic square, Jigsaw puzzle, Kendoku, Kakuro, Divide |
| 5.Week | Verbal Games | Anagrams, Scrabble, Word grouping, Word hunt, Word insertion |
| 6.Week | Geometric–Mechanical Games | Tangram, Polyomino, Knots, Rubik's cube, Soma cubes, Mechanical separation puzzles |
| 7.Week | Memory Games | Match-finding games, Picture recall, Direction finding |
| 8.Week | An overview | In this section, the general repetition of the information learned in the other weeks was made, and the children were provided to present creative problems and propose solutions. |

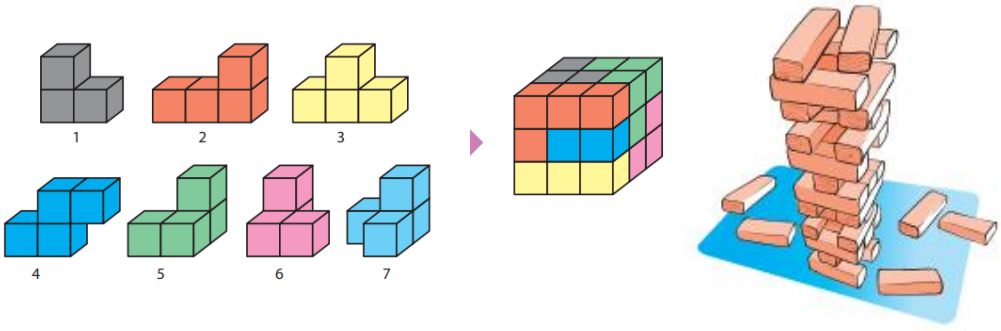


**Figure 1.** Soma cube and jenga game image (MEB, 2016)

**Analysis of Data**

The research data was analyzed in seven stages. These stages are as follows:

1) the questionnaire forms distributed to the students were sorted, and the data were checked.

2) the data from the pre-test and post-test were transferred to the statistics program.

3) the demographic information of the students in the research study group was determined.

4) the mean scores of the creative problem-solving scale scores (in the context of the experimental and control groups) were calculated in total through the statistical program.

5) The obtained data were examined for normal distribution and other normality assumptions. The kurtosis and skewness values vary between -1.5 and +1.5, indicating that the data set has a normal distribution and parametric tests can be used (Fidell & Tabachnick, 2007).

6) The study used parametric tests (t-tests for related and unrelated samples) once the data as standard.

7) The research findings were presented in the context of the data obtained.

**Ethics Committee Approval**

The ethics committee issued a certificate stating that the study was ethical and that there were no unethical findings in the data collection tools or the study's purpose. A child consent form was also obtained from the 4th-grade students at the primary school who participated in the research, as well as written consent from the children's teachers and parents. Parents, teachers, and students were all informed about the purpose of the study and the results that would be obtained. Parents, students, and teachers were informed that no other application would be made other than the research objectives and that if such a situation arose, they could withdraw from the study at any time. In terms of ethics, the teacher of the control group was also informed about the activities performed on the experimental group so that the children in the control group could receive a similar education. The teacher received adequate technical support (educational information, related equipment, etc.). The teacher's procedures were followed.

## Findings and Interpretation

This section presents findings on the effect of MIG-based activities on primary school students' creative problem-solving skills.

**Tablo 4.** Experimental group pretest and posttest t-test results

| | **X** | **ss** | ***t*** | *Sd* | *p* |
|---|---|---|---|---|---|
| Creative Problem-Solving Scale Total Score Pre-Test Results | 91,25 | 21,59 | 12,894 | 38 | ,000 |
| Creative Problem-Solving Scale Total Score Post-Test Results | 124,23 | 14,71 | | | |

| | | | | | |
|---|---|---|---|---|---|
| Divergent Thinking Pre-Test Results | 26,53 | 9,32 | 6,311 | 38 | ,000 |
| Divergent Thinking Post-Test Results | 32,87 | 7,42 | | | |
| Convergent Thinking Pre-Test Results | 17,53 | 4,62 | 7,645 | 38 | ,000 |
| Convergent Thinking Post-Test Results | 21,79 | 4,13 | | | |
| Motivation Pre-Test Results | 12,20 | 3,02 | 10,736 | 38 | ,000 |
| Motivation Posttest Results | 18,74 | 2,08 | | | |
| Environmental Pre-Test Results | 24,10 | 7,27 | 9,864 | 38 | ,000 |
| Environmental Final Test Results | 34,23 | 5,04 | | | |
| General Knowledge and Skill Level Pre-Test Results | 10,87 | 4,48 | 9,002 | 38 | ,000 |
| General Knowledge and Skill Level Post-Test Results | 16,58 | 3,51 | | | |

*$p<.05$

As seen in Table 4., there is a statistically significant difference in favor of the posttest scores between the pre ($\bar{x}_{(pretest)}$ = 91,2564) and post($\bar{x}_{(posttest)}$ = 124,2308) test measurements among the creative problem-solving scale total scores of the experimental group students ($t_{(39)}$ =12.894; $p<.05$). In addition, when the table is examined, the sub-dimensions of the creative problem solving scale divergent thinking sub-dimension pre ($\bar{x}_{(pretest)}$ = 26,5385) and post ($\bar{x}_{(posttest)}$ = 32,8718), convergent thinking sub-dimension pre ($\bar{x}_{(pretest)}$) = 17.5385) and final ($\bar{x}_{(posttest)}$ = 21.7949), motivation sub-dimension pre ($\bar{x}_{(pretest)}$ = 12.2051) and post($\bar{x}_{(posttest)}$ = 18.7436), environment subscale sub-dimension pre-($\bar{x}$(pretest) = 24.1026) and post($\bar{x}$(posttest) = 34.2308), general knowledge and skill level sub-dimension pre($\bar{x}_{(pretest)}$ = 10.8718) and post ($\bar{x}$)$_{(posttest)}$ = 16,5897) scores in favor of posttest scores ($p<.05$). According to this result, it is seen that the post-test mean scores are higher than the pre-test mean scores. These findings can be interpreted as MIG-based activities significantly and positively affecting all sub-dimensions of primary school 4th-grade students' creative problem-solving skills.

**Tablo 5.** Control group pretest and posttest t-test results

| | **X** | **ss** | ***t*** | *Sd* | *p* |
|---|---|---|---|---|---|
| Creative Problem-Solving Scale Total Score Pre-Test Results | 89,97 | 19,49 | 1,146 | 35 | ,260 |
| Creative Problem-Solving Scale Total Score Post-Test Results | 93,22 | 13,14 | | | |
| Divergent Thinking Pre-Test Results | 26,22 | 9,04 | 1,172 | 35 | ,249 |
| Divergent Thinking Post-Test Results | 26,77 | 6,05 | | | |
| Convergent Thinking Pre-Test Results | 17,33 | 3,98 | 1,607 | 35 | ,117 |
| Convergent Thinking Post-Test Results | 17,35 | 3,10 | | | |
| Motivation Pre-Test Results | 11,75 | 2,94 | 2,832 | 35 | ,008 |
| Motivation Posttest Results | 13,61 | 3,16 | | | |
| Environmental Pre-Test Results | 23,38 | 7,20 | 1,479 | 35 | ,148 |
| Environmental Final Test Results | 25,22 | 4,61 | | | |
| General Knowledge and Skill Level Pre-Test Results | 11,27 | 4,37 | 2,671 | 35 | ,011 |
| General Knowledge and Skill Level Post-Test Results | 13,36 | 3,76 | | | |

*$p>.05$

As seen in Table 5., it is seen that there is no statistically significant difference between the pre ($\bar{x}_{(pretest)}$ = 89.9722) and post ($\bar{x}_{(posttest)}$ = 93,2222) test measurements among the creative problem-solving scale total scores of the control group students ($t_{(35)}$ =1.146; $p>.05$). In addition, when the table is examined, it is seen that there is no significant difference between the sub-dimensions of the creative problem-solving scale, divergent thinking, convergent thinking, environment, pre-test and post-test scores of sub-dimensions. However, the motivation sub-dimension of the creative problem-solving scale is pre ($\bar{x}_{(pretest)}$ = 11,7500) and post ($\bar{x}_{(posttest)}$ = 13,6111), general knowledge and skill level sub-dimension are pre ($\bar{x}_{(pretest)}$ = 11.2778) and posttest ($\bar{x}_{(posttest)}$ = 13.3611), there are significant differences in favor of posttest scores ($p<.05$).

**Tablo 6.** Experimental and control group pre-test measurements t-test results

| | Groups | n | X | Ss | *t* | *Sd* | *p* |
|---|---|---|---|---|---|---|---|
| Creative Problem-Solving Scale Total Score | Experimental Group | 39 | 91,25 | 21,59 | ,270 | 73 | ,788 |
| | Control Group | 36 | 89,97 | 19,49 | | | |
| Divergent Thinking | Experimental Group | 39 | 26,53 | 9,32 | ,149 | 73 | ,882 |
| | Control Group | 36 | 26,22 | 9,04 | | | |
| Convergent Thinking | Experimental Group | 39 | 17,53 | 4,62 | ,205 | 73 | ,838 |
| | Control Group | 36 | 17,33 | 3,98 | | | |
| Motivation | Experimental Group | 39 | 12,20 | 3,02 | ,659 | 73 | ,512 |
| | Control Group | 36 | 11,75 | 2,94 | | | |
| Environment | Experimental Group | 39 | 24,10 | 7,27 | ,426 | 73 | ,671 |
| | Control Group | 36 | 23,38 | 7,20 | | | |
| General Knowledge and Skill Level | Experimental Group | 39 | 10,87 | 4,48 | -,396 | 73 | ,693 |
| | Control Group | 36 | 11,27 | 4,37 | | | |

**p>.05*

As seen in Table 6., it is seen that there is no statistically significant difference between the pretest ($\bar{x}_{\text{Control Group}}$ = 89.9722; $\bar{x}_{\text{Experimental Group}}$ = 91,2564) measurements of the creative problem solving scale total scores of primary school 4th grade students in the experimental and control groups ($t_{(73)}$ = 270; p>.00). In addition, when the table is examined, it is seen that there is no significant difference between the pre-test scores of divergent thinking, convergent thinking, motivation, environment, general knowledge and skill level sub-dimensions of the creative problem-solving scale in the context of the experimental and control groups (p>.05). The fact that the difference between the experimental and control groups in terms of the total scores of the creative problem-solving scale and the total scores of the sub-dimensions was insignificant can be interpreted as the fact that the groups were equivalent to each other in terms of creative problem-solving skills before the application.

**Tablo 7.** Experimental and control group post-test measurements t-test results

| | Groups | n | X | SS | *t* | *Sd* | *p* |
|---|---|---|---|---|---|---|---|
| Creative Problem-Solving Scale Total Score | Experimental Group | 39 | 124,23 | 14,71 | 9,596 | 73 | ,000 |
| | Control Group | 36 | 93,22 | 13,14 | | | |
| Divergent Thinking | Experimental Group | 39 | 32,87 | 7,42 | 5,148 | 73 | ,000 |
| | Control Group | 36 | 24,77 | 6,05 | | | |
| Convergent Thinking | Experimental Group | 39 | 21,79 | 4,13 | 6,524 | 73 | ,000 |
| | Control Group | 36 | 16,25 | 3,10 | | | |
| Motivation | Experimental Group | 39 | 18,74 | 2,08 | 8,353 | 73 | ,000 |
| | Control Group | 36 | 13,61 | 3,16 | | | |
| Environment | Experimental Group | 39 | 34,23 | 5,04 | 8,046 | 73 | ,000 |
| | Control Group | 36 | 25,22 | 4,61 | | | |
| General Knowledge and Skill Level | Experimental Group | 39 | 16,58 | 3,51 | 3,841 | 73 | ,000 |
| | Control Group | 36 | 13,36 | 3,76 | | | |

**p<.05*

As seen in Table 7., the creative problem-solving scale total scores of primary school 4th-grade students in the experimental and control groups were statistically in favor of the experimental group students between the posttest ($\bar{x}_{\text{Control Group}}$ = 93,2222; $\bar{x}_{\text{Experimental Group}}$ = 124,2308) measurements. It is seen that there is a significant difference ($t_{(73)}$ = 9.596; p<.00). In addition, when the table is examined, divergent thinking sub-dimension ($\bar{x}_{\text{Control Group}}$ = 24.7778; $\bar{x}_{\text{Experimental Group}}$ = 32.8718), convergent thinking sub-dimension ($\bar{x}_{\text{Control Group}}$ = 16.2500; $\bar{x}_{\text{Experimental Group}}$ = 21.7949), motivation sub-dimension ($\bar{x}_{\text{Control Group}}$ = 13.6111; $\bar{x}_{\text{Experimental Group}}$ =

18.7436), environment sub-dimension $\bar{x}_{(\text{Control Group})} = 25.2222$; $\bar{x}_{(\text{Experimental Group})} = 34.2308$, general knowledge and skill level sub-dimension $\bar{x}_{(\text{Control Group})} = 16.5897$; It is seen that there is a significant difference between the posttest scores of the experimental and control groups in favor of the experimental group between the $\bar{x}_{(\text{Experimental Group})} = 16,5897$) scores ($p>.05$). The fact that the experimental group students scored higher on the creative problem-solving scale and its sub-dimensions than the control group students shows that mind and intelligence activities contribute to creative problem solving.

## Conclusion and Discussion

The research found that MIG was significantly effective in developing divergent thinking, convergent thinking, motivation, and general knowledge and skills sub-dimensions of students' creative problem-solving skills. There was also an improvement in the environment sub-dimension. However, it is a minor development. The sub-dimensions of creative problem-solving skills of students in the control group who did not participate in MIG activities increased. This improvement was significant in the motivation and general knowledge/skills sub-dimensions. However, it was discovered that the development in other sub-dimensions was insignificant. The arithmetic mean of the scores of the students in the experimental and control groups from the pre-test before the applications were found to be quite close to each other, and the difference observed between the arithmetic averages was not significant. When the post-test scores of the students in the experimental and control groups were compared, it was discovered that the difference between both the creative problem-solving scores and the creative problem-solving skills sub-dimensions was significantly different in favor of the experimental group. In other words, MIG is an influential factor in improving students' creative problem-solving abilities.

When the results of the study with MIG are examined, it both supports creativity (Demirel, 2015; Ott & Pozzi, 2012; Siew & Abdullah, 2012; Masters & Houston, 1972) and improves problem-solving skills (Devecioğlu & Karadağ, 2014; Alkaş Ulusoy et al., 2017; Mestre, 2007; Reiter, Thornton, & Vennebush, 2014; Şahin, 2019), it can be said that it is also effective on creative problem-solving. MIG includes high-level thinking skills such as divergent thinking, problem-solving, and creativity (Alessi & Trollip, 2001). This may be because students who use, discover, or enhance their creativity and problem-solving abilities in the MIG process transfer them to creative problem-solving. It can also be thought that students learn these skills through insight, not conditioning. The ability to quickly adapt solutions to similar circumstances is a distinguishing quality of behaviors acquired through insight. According to research (Bottino et al., 2009; Çubukçu & Baçeli-Kahraman, 2017; Kurbal, 2015), a clear and significant correlation exists between MIG and problem-solving, creative thinking, and innovative problem-solving.

The following conclusions can be drawn after looking at the data in terms of the subdimensions of the creative problem-solving scale: According to the t-test results for the significance of the difference between the pre-test and post-test scores of the students in the experimental group, it was seen that the creative problem-solving scale of MIG was most effective on the sub-dimensions of motivation, environment, general knowledge, and skill level. MIG also significantly increased divergent and convergent thinking. However, this effect is less than other sub-dimensions. Although the increase in the motivation and general knowledge, and skill levels of the students in the control group is significant, it should not be forgotten that there is a significant difference in favor of the experimental group between the scores of the students in the experimental and control groups from the posttest.

Based on these findings, teachers should play MIG while teaching creative problem-solving skills or performing healing activities with students who are struggling in this area. Furthermore, cognitive apprenticeships may be recommended, mainly when playing strategy games such as chess, which requires divergent thinking, or games such as Jenga, which requires convergent thinking and yields immediate results. MIG will also assist students who are unwilling to solve problems or have difficulty working with their friends

to overcome these problems. However, it should be noted that other educational activities will positively impact teamwork and motivation. MIG enhances cognitive abilities while also having a positive impact on academic success (Bottino, Ott & Benigno, 2009; Bottino, Ott & Tavella, 2013). On the other hand, educational games, according to Kafai (2006), help students develop their interpretation skills. In this regard, MIG should be effectively applied in learning settings.

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# Examination of Exercise and Nutrition Habits of Students Studying in Health Departments

*Research Article*

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ABSTRACT

The purpose of this study was to ascertain the dietary and activity habits of university students majoring in health. In the 2022–2023 academic year, 510 (197 men, 313 women) volunteer students from Bitlis Eren University's Faculty of Health Sciences and School of Health Services were organized into the research group. The "Personal Information Form" was utilized in the study as a tool for gathering data, and the "Nutrition-Exercise Behavior Scale (NEBS)" was used to assess the students' dietary and exercise practices. Data analysis was performed using the SPSS statistical package tool. P 0.05 was considered significant. The study's findings revealed that students' dietary and exercise habits were moderate, that female students' nutritional and exercise point averages were greater than male students', and that faculty students' average scores were higher than those of college students. The bulk of the research group was found to not routinely exercise. It has been noted that students who frequently exercise score higher on average across all sub-dimensions of diet and exercise than students in the other groups. The gender of the study group, the program they examined, and the nutrition exercise behavior scale were shown to be positively and significantly correlated. The students' dietary and exercise habits were seen to be modest, and their regular exercise status was insufficient. It might be proposed in this regard that activities on the value of a balanced diet and regular exercise be organized at universities in order to raise generations that are healthy.



**Keywords:**
Nutrition, Exercise, Student, Health

## Introduction

Healthy eating is viewed as a vital component of life that has positive effects on people's physical, mental, physiological, and social well-being. Healthy nutrition is described as including the eating of foods that are safe and helpful for the body (Gönen and Ceyhan, 2022). People require both appropriate nutrition

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knowledge and effective nutrition education in order to obtain a healthy diet. Nutrition education can take place in the family environment, in the environment they live in, as well as in university and dormitory environments where they interact with people (Kartal et al., 2019). In order to maintain a healthy life, it is important to have a healthy eating habit as well as a regular exercise habit.

Exercise is described as physical activities that are organized, repeated, and planned with the goal of preserving a person's physical and physiological features (Küçük et al., 2022). Exercise affects the body physically and physiologically, as is well recognized. Regular exercise routines are especially beneficial in preventing illnesses of the cardiovascular system, skeletal and muscular system, coronary heart diseases, non-insulin-dependent diabetes, and in maintaining physical fitness parameters (Erdoğan and Aslan, 2021; Pekçetin and İnal, 2018; Şahin et al., 2018; Çabuk et al. ., 2020.). Especially, the youth period is stated as the period when the foundations of a healthy life are laid. There are significant changes and developments in the lives of university students during the youth period. In particular, these changes and differences affect students' healthy lifestyle behaviors as well as nutrition and exercise habits (Doğan et al.). In line with this information, this period, in which the healthy lifestyle behaviors of people who have university education, as well as their nutrition exercise behaviors change and develop, is extremely important (Bülbül et al., 2020). For these reasons, it will contribute positively to the future professional and social life in which the individual can develop these habits during the university period. On the other hand, there is an increase in the level of tendency to negative behaviors in terms of health at the beginning of university life. In particular, these behaviors are exercises that are not done regularly, an increase in body weight with inadequate and unhealthy nutrition, and a further level of chronic diseases in the body and a tendency to obesity (Arıcan, 2021). Especially during university years, it is important in terms of helping students develop healthy eating behaviors by establishing nutritional habits and exercise areas and preventing diseases that may occur in the organism due to lack of exercise. In this context, although there are studies that determine the healthy lifestyle behaviors of university students, it is thought that the nutrition exercise behaviors of the students studying in the health departments of the universities are not sufficiently mentioned and it is important in this respect. In this study, it was aimed to determine the nutritional exercise behaviors of the students studying in the health departments of universities.

## Method

### Study Model

This research, which aims to determine the nutrition and exercise behaviors of students studying in health departments, is in the screening model and descriptive in nature. Studies aimed at collecting data are called survey research to identify certain features of a group survey model. (Buyukozturk, Cakmak, Akgun, Karadeniz and Demirci, 2009).

### Population and Sample

The research group in the 2022-2023 academic year, 510 (197 Male, 313 Female) volunteer students studying at Bitlis Eren University Faculty of Health Sciences and School of Health Services were formed.

**Table 1.** Demographic Information of Students

| | | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Male | 197 | 38,6 |
| | Female | 313 | 61,4 |
| Height | 150-160 cm | 122 | 23,9 |
| | 161-170 cm | 213 | 41,8 |
| | 171-180 cm | 144 | 28,2 |
| | 181 cm and over | 31 | 6,1 |

| | | | |
|---|---|---|---|
| Body Weight | 50-60 kg | 209 | 41 |
| | 61-70 kg | 149 | 29,2 |
| | 71-80 kg | 94 | 18,4 |
| | 81-90 kg | 44 | 8,6 |
| | 91 kg and over | 14 | 2,7 |
| Regular Exercise Status | Faculty | 116 | 22,7 |
| | No | 171 | 33,5 |
| | Partly | 223 | 43,7 |
| Program | Faculty | 256 | 50,2 |
| | Academy | 254 | 49,8 |
| Perceived Economical Status | Low | 115 | 22,5 |
| | Average | 324 | 63,5 |
| | High | 71 | 13,9 |
| Nutrition Training Status | Yes | 203 | 39,8 |
| | No | 307 | 60,2 |
| Weekly Exercise Status | 1 day | 253 | 49,6 |
| | 2 days | 127 | 24,9 |
| | 3 days | 83 | 16,3 |
| | 4 days and over | 47 | 9,2 |
| Do you have any Chronic illness | Yes | 62 | 12,2 |
| | No | 448 | 87,8 |

When Table 1 is examined, the research group; 38.6% were male, 61.4% were female, 41.8% were 161-170 cm, 28.2% were 171-180 cm, 23.9% were 150-160 cm and 6.1% had a height of 181 cm and above, 41% had 50-60 kg, 29.2% had 61-70 kg, 18.4% had 71-80 kg, 8.6% It was observed that 81-90 kg and 2.7% of them had a body weight over 91 kg. 63.5% of the students had medium, 22.55% low and 13.9% perceived high level of income, 60.2% did not receive nutrition education, 87.8% did not have any chronic diseases. In addition, it was observed that the majority of the students did not exercise regularly.

**Data Collection Tools**

The questionnaire method, one of the data collection techniques, was used in the research. In order to obtain the data, the "Personal Information Form" prepared by the researcher and the "Nutrition-Exercise Behavior Scale (NEBS)" developed by Yurt et al., (2016) to determine the exercise and nutritional habits of the students and consisting of 45 questions, were supplied to the participants during the data assembling process (Yurt et al., 2016).

**Nutrition-Exercise Behavior Scale (NEBS)**

The scale is five-point Likert type and consists of 45 questions and 4 sub-dimensions. Also on the scale; Items 7, 8, 9, 10, 11, 12, 14, 15, 17, 18, 20, 22, 30, 31, 32, 34, 35, 36, 37, 38, 39, 42 and 43 are reverse scored.

Grading and score limits of the scale form;

**Grading:**

Doesn't Describe Me At All: 1.00

Describes Me Little: 2

Describes Me A Little: 3

Describes Me Mostly: 4

Describes Me Completely: 5

**Minimum and Highest Score Limits that Can be Taken from Scale Sub-Dimensions:**

Psychological Eating Behavior: 11-55

Healthy Eating-Exercise Behavior: 14-70

Unhealthy Nutrition-Exercise Behavior: 14-70

Meal Layout: 6-30

The validity and reliability study of the Nutrition-Exercise Behavior Scale (NEBS) was conducted out by the researchers and (Cronbach Alpha) was determined as $\alpha$= 0.85.

**Analysis of Data**

The statistical software SPSS was used to examine the data. Using descriptive statistics like percentage, frequency, arithmetic mean, and standard deviation, the research group's dietary, activity, and demographic data were compiled. The skewness and kurtosis values of the data were checked to determine whether the data showed a normal distribution. If the skewness and kurtosis values are between +2 and -2, the data are considered to be normally distributed (George & Mallery, 2010). After it was determined that the data showed normal distribution, Independent Samples t and One-Way ANOVA tests were applied for in-group comparisons. Pearson correlation analysis was used to measure the relationship between NEBS total and sub-dimension scores. Correlation analysis was used to determine the direction of the relationship between the variables, and regression analysis was used to determine the effect of the gender variable on nutrition-exercise behaviors. Significance was confirmed as $p< 0.05$.

**Table 2.** Mean, Standard Deviation, Skewness and Kurtosis Values of the Nutrition-Exercise Behavior Scale and its Sub-Dimensions

| **Variables** | ***Mean*** | ***Sd*** | ***Skewness*** | ***Kurtosis*** |
|---|---|---|---|---|
| Psychological/Addictive Eating Behavior | 30,20 | 6,88 | ,198 | ,633 |
| Healthy Eating-Exercise Behavior | 40,84 | 8,69 | ,375 | ,326 |
| Unhealthy Eating-Exercise Behavior | 38,56 | 7,74 | ,405 | 1,273 |
| Meal Layout | 19,35 | 5,81 | -,183 | -,547 |
| Nutrition-Exercise Behavior Scale Total | 128,99 | 21,47 | ,363 | 1,985 |

## Results

**Table 3.** Nutrition-Exercise Behavior Sale Article Averages

| | $\overline{X}$ | ***sd*** |
|---|---|---|
| 1) I have a regular breakfast every day. | 3,02 | 1,56 |
| 2) I eat my lunch every day. | 3,33 | 1,41 |
| 3) I eat my dinner every day. | 4,08 | 1,23 |
| 4) I eat my meals at the same times every day. | 2,67 | 1,34 |
| 5) I regularly eat my lunch outside or at home. | 2,99 | 1,40 |
| 6) I eat my dinner at home with my family. | 3,13 | 1,47 |
| 7) I usually eat something while studying | 2,63 | 1,38 |
| 8) I go to the fridge for a snack 4-5 times after meals and in between | 2,73 | 1,38 |
| 9) I eat foods such as chips, nuts, chocolate every day. | 2,41 | 1,32 |
| 10) I eat the food offered-offered even when I am full. | 2,51 | 1,24 |
| 11) I eat sandwiches, biscuits and bagels between meals. | 2,31 | 1,23 |
| 12) I eat foods such as hamburgers and fries every day. | 1,87 | 1,08 |
| 13. I continue to exercise even when I am injured. | 2,01 | 1,34 |
| 14) I drink soft drinks and soda between meals. | 2,49 | 1,43 |

| | | |
|---|---|---|
| 15) I drink tea/coffee every day. | 3,52 | 1,39 |
| 16) I chew my food very well. | 3,35 | 1,25 |
| 17) My eating time changes frequently | 3,19 | 1,29 |
| 18) I finish my meal in less than 20 minutes. | 3,14 | 1,33 |
| 19) The amount I eat at meals is usually the same. | 3,11 | 1,21 |
| 20) I fill my dinner plate with a lot of food. | 2,90 | 1,33 |
| 21) I plan what I will eat with my meals. | 2,70 | 1,43 |
| 22) I eat a food I like until I finish it without adjusting the amount. | 3,05 | 1,37 |
| 23) I eat a portion of vegetable meal or salad for lunch and dinner. | 2,80 | 1,22 |
| 24) I eat three fruits a day. | 2,40 | 1,21 |
| 25) I drink 1.5-2 liters of water a day. | 3,20 | 1,38 |
| 26) I eat foods such as milk, yogurt, ayran, cheese every day. | 3,25 | 1,33 |
| 27) I eat meat, chicken or fish for meals at least three days a week | 3,09 | 1,36 |
| 28) I include legumes such as chickpeas, dry beans and lentils in my meals. | 3,16 | 1,22 |
| 29) I include foods such as bread, rice, pasta, pastry in my meals. | 3,31 | 1,29 |
| 30) I eat sweets every day | 2,94 | 1,25 |
| 31) I include oil and fatty foods in my meals every day. | 2,76 | 1,24 |
| 32) Every day, I include products prepared as a Nutrition in my Nutrition. | 2,38 | 1,25 |
| 33) I read the labels showing the nutritional elements on the food products. | 2,67 | 1,39 |
| 34) Eating is one of the things I enjoy. | 3,39 | 1,32 |
| 35) I eat more when I am with my friends. | 3,42 | 1,26 |
| 36) I eat more when I'm alone. | 2,75 | 1,36 |
| 37) I eat more when I am sad. | 2,43 | 1,33 |
| 38) Eating something calms me down when I'm angry. | 2,26 | 1,26 |
| 39) I eat more when I have a problem that I cannot solve. | 2,14 | 1,26 |
| 40) I take every opportunity to do sports or physical exercise. | 2,76 | 1,32 |
| 41) I engage in behaviors that increase my amount of activity (like walking to school). | 3,14 | 1,36 |
| 42) Even for short distances, I take buses, cars, minibuses, etc. | 2,58 | 1,37 |
| 43) I use the elevator instead of the stairs when going up or down in the building. | 3,05 | 1,33 |
| 44) I feel better after doing sports or physical exercise. | 3,29 | 1,36 |
| 45) I do sports or physical exercise for half an hour at least 3 days a week. | 2,75 | 1,41 |
| Psychological/Addictive Eating Behavior | 30,24 | 6,88 |
| Healthy Eating-Exercise Behavior | 41,05 | 8,69 |
| Unhealthy Eating-Exercise Behavior | 38,71 | 7,74 |
| Meal Layout | 19,24 | 5,81 |
| Nutrition-Exercise Behavior Scale Total | 129,26 | 21,47 |

When Table 3 is assessed, the research group; It was analyzed that the statement "I eat my dinner every day" had an item average of 4.08±1.23, the statement "I eat more when I was with my friends" had an average of 3.42±1.26 items, and the students generally agreed. Students; It was observed that the statement "I eat foods such as hamburgers and potatoes every day" had an item average of 1.87±1.08, while the statement "I continue to exercise even when I was injured" did not agree with a mean of 2.01±134 items. In addition, the Psychological/addictive eating behavior sub-dimension of the research group averaged 30.24±6.88 points, the healthy eating-exercise behavior sub-dimension averaged 41.05±8.69, the unhealthy Nutrition-exercise behavior sub-dimension 38.71±7, It was determined that 74 points average, meal order sub-dimension 19.24±5.81 and nutrition and exercise behavior scale total 129.26±21.47 points.

**Table 4.** Students' t-Test Analysis According to Gender Variable

| | | *Gender* | | | |
|---|---|---|---|---|---|
| | | $\overline{X}$ | **Sd** | ***t*** | ***p*** |
| Psychological/Addicted Eating Habit | Male | 30,42 | 7,90 | ,448 | 0,65 |
| | Female | 30,14 | 6,16 | | |
| Healthy Nutrition-Exercise Behavior | Male | 41,37 | 10,30 | ,652 | 0,51 |
| | Female | 40,85 | 7,51 | | |
| Unhealthy Nutrition-Exercise Behavior | Male | 38,26 | 9,24 | -1,024 | 0,30 |
| | Female | 38,99 | 6,62 | | |
| Meal Layout | Male | 19,18 | 6,35 | -,176 | 0,86 |
| | Female | 19,28 | 5,44 | | |
| Nutrition-Exercise Behavior Scale Total | Male | 129,25 | 26,98 | -,009 | 0,99 |
| | Female | 129,27 | 17,16 | | |

*p<0,05

When Table 4 was examined, it was seen that there was no statistically significant difference between the gender variable of the study group and the total and sub-dimensions of the nutrition exercise behavior scale (p>0.05).

**Table 5.** t-Test Analyzes According to the Program the Research Group Participate

| | | *Program* | | | |
|---|---|---|---|---|---|
| | | $\overline{X}$ | ***Sd*** | ***t*** | ***p*** |
| Psychological/Addicted Eating Habit | Faculty | 31,48 | 6,56 | 4,133 | 0,00* |
| | Academy | 29,00 | 6,98 | | |
| Healthy Nutrition-Exercise Behavior | Faculty | 42,42 | 8,83 | 3,617 | 0,00* |
| | Academy | 39,67 | 8,84 | | |
| Unhealthy Nutrition-Exercise Behavior | Faculty | 39,70 | 7,59 | 2,936 | 0,00* |
| | Academy | 37,70 | 7,77 | | |
| Meal Layout | Faculty | 19,59 | 5,69 | 1,361 | 0,17 |
| | Academy | 18,89 | 5,91 | | |
| Nutrition-Exercise Behavior Scale Total | Faculty | 133,21 | 20,50 | 4,240 | 0,00* |
| | Academy | 125,28 | 21,72 | | |

*p<0,05

When Table 5 is examined, it was determined that there was a significant difference between the program variable in which the group was educated and the mean score of Psychological/addicted eating behavior, healthy nutrition-exercise behavior and unhealthy Nutrition-exercise behavior from the total and scale sub-dimensions of the nutrition exercise behavior scale (p<0.05). It was found that there was no significant difference between the mean scores (p>0.05). A significant difference was found between the views of faculty and college students in the Psychological/Addictive Eating Behavior sub-dimension [t=4,133,

p<.0.05]. The answers of the faculty students were at the level of ($\bar{x}$=31,48), and the answers of the college students were at the level of ($\bar{x}$=29,00).

A significant difference was determined between the views of faculty and college students in the Healthy Eating-Exercise Behavior sub-dimension [t=3,617, p<.0.05]. The answers of the faculty students were at the level of ($\bar{x}$=42,42), and the answers of the college students were at the level of ($\bar{x}$=39,67).

A significant difference was determined between the views of faculty and college students in the Unhealthy Nutrition-Exercise Behavior sub-dimension [t=2,936, p<.0.05]. The answers of the faculty students were at the level of ($\bar{x}$=39.70), while the answers of the college students were at the level of ($\bar{x}$=37.70). A significant difference was determined between the views of faculty and college students in the Nutrition-Exercise Behavior Scale total [t=4,240, p<.0.05]. The answers of the faculty students were at the level of ($\bar{x}$=133,21), and the answers of the college students were at the level of ($\bar{x}$=125,28). It was observed that the students studying at the faculty had higher average scores in the nutrition exercise behavior scale and its sub-dimensions than the students studying at the college.

**Table 6.** t-Test Analysis According to the Nutrition Education Status of the Research Group

| | ***Nutrition Education Status*** | | | ***t*** | ***p*** |
|---|---|---|---|---|---|
| | | $\overline{X}$ | ***Sd*** | | |
| Psychological/Addicted Eating Habit | Yes | 31,70 | 6,58 | 3,938 | 0,00* |
| | No | 29,28 | 6,91 | | |
| Healthy Nutrition-Exercise Behavior | Yes | 42,05 | 9,57 | 2,120 | 0,03* |
| | No | 40,39 | 8,00 | | |
| Unhealthy Nutrition-Exercise Behavior | Yes | 39,79 | 8,49 | 2,579 | 0,01* |
| | No | 37,99 | 7,12 | | |
| Meal Layout | Yes | 19,96 | 6,05 | 2,286 | 0,02* |
| | No | 18,78 | 5,60 | | |
| Nutrition-Exercise Behavior Scale | Yes | 133,52 | 2309 | 3,686 | 0,00* |
| | No | 126,44 | 19,86 | | |

*p<0,05

When Table 6 was evaluated, it was determined that there was a significant difference between the nutritional education status of the research group and the total score of the nutrition exercise behavior scale and the scale sub-dimensions (p<0.05). In the Psychological/Addictive Eating Behavior sub-dimension, a significant difference was determined between the views of the students who received and did not receive nutrition education [t=3,938, p<.0.05]. The answers of the students who received nutrition education were at the level of (X̄=31.78), and the answers of the students who did not receive nutrition education were at the level of (X̄=29.28).

A significant difference was determined between the views of the students who received and did not receive nutrition education in the Healthy Nutrition-Exercise Behavior sub-dimension [t=2,120, p<.0.05]. The answers of the students who received nutrition education were at the level of (X̄=42.05), and the answers of the students who did not receive nutrition education were at the level of (X̄=40.39).

A significant difference was determined between the views of the students who received and did not receive nutrition education in the Unhealthy Nutrition-Exercise Behavior sub-dimension [t=2,579, p<.0.05]. The answers of the students who received nutrition education were at the level of (X̄=39.79), and the answers of the students who did not receive nutrition education were at the level of (X̄=37.99).

A significant difference was determined between the views of the students who received and did not receive nutrition education in the Meal Order sub-dimension [t=2.286, p<.0.05]. The answers of the students who received nutrition education were at the level of (X̄=19.96), and the answers of the students who did not receive nutrition education were at the level of (X̄=18.78).

A significant difference was determined between the views of the students who received and did not receive nutrition education in the total of the Nutrition-Exercise Behavior Scale [t=3,686, p<.0.05]. The answers of the students who received nutrition education were at the level of (X̄=133.52), and the answers of the students who did not receive nutrition education were at the level of (X̄=126,44). It was determined that the students who received nutrition education had higher average scores than the students who did not receive nutrition education in the nutrition exercise behavior scale and its sub-dimensions.

**Table 7.** t-Test Analyzes of the Research Group by Chronic Disorder Status

| | | ***Chronic Disorder Status*** | | | |
|---|---|---|---|---|---|
| | | $\overline{X}$ | ***Sd*** | ***t*** | ***p*** |
| Psychological/Addicted Eating Habit | Yes | 32,06 | 3,63 | 2,224 | 0,02* |
| | No | 29,99 | 7,18 | | |
| Healthy Nutrition-Exercise Behavior | Yes | 40,75 | 8,37 | -,290 | 0,77 |
| | No | 41,10 | 8,74 | | |
| Unhealthy Nutrition-Exercise Behavior | Yes | 36,64 | 4,34 | -2,251 | 0,02* |
| | No | 38,99 | 8,06 | | |
| Meal Layout | Yes | 17,56 | 3,70 | -2,442 | 0,01* |
| | No | 19,47 | 6,01 | | |
| Nutrition-Exercise Behavior Scale | Yes | 127,03 | 12,58 | -,873 | 0,38 |
| | No | 129,57 | 22,41 | | |

*p<0,05

When Table 7 is examined, it was monitored out that there was a statistically significant difference between the chronic disease status of the research group and the scale sub-dimensions psychological/addictive eating behavior, unhealthy diet-exercise behavior and meal order mean score (p<0.05), while the total and scale sub-dimensions of the nutrition exercise behavior scale were found to be statistically different (p<0.05). It was observed that there was no significant difference between the mean scores of healthy eating-exercise behavior sub-dimensions (p>0.05). In the Psychological/Addictive Eating Behavior sub-dimension, a significant difference was determined between the views of students with chronic illness and those without chronic illness [t=2.224, p<.0.05]. The answers of the students with chronic illness were at the level of (X̄=32.06) and the answers of the students without chronic illness were at the level of (X̄=29.99).

It has been observed that students with chronic illness have a higher average score in the Psychological/Addictive Eating Behavior sub-dimension than students without chronic illness. In the Unhealthy Nutrition-Exercise Behavior sub-dimension, a significant difference was determined between the views of students with chronic illness and those without chronic illness [t=-2.251, p<.0.05]. The answers of the

students with chronic illness were at the level of ($\bar{X}$=36.64) and the answers of the students without chronic illness were at the level of ($\bar{X}$=38.99).

It has been observed that students without chronic disease have a higher average score in the Unhealthy Nutrition-Exercise Behavior sub-dimension than students with chronic diseases. In the Meal Plan sub-dimension, a significant difference was found between the views of students with chronic illness and those without chronic illness [t=-2,442, p<.0.05]. The answers of the students with chronic illness were at the level of ($\bar{X}$=17.56) and the answers of the students without chronic illness were at the level of ($\bar{X}$=19.47). It was observed that students without chronic illness had a higher average score in the Meal Plan sub-dimension than students with chronic illness.

**Table 8.** Analysis of Variance by Height Variable of the Research Group

| | | ***Height*** | | ***F*** | ***Sig*** |
|---|---|---|---|---|---|
| | | $\bar{X}$ | ***Sd*** | | |
| Psychological/Addicted Eating Habit | 150-160 cm | 31,22 | 5,44 | 1,736 | 0,15 |
| | 161-170 cm | 29,98 | 7,29 | | |
| | 171-180 cm | 30,23 | 6,58 | | |
| | 181 cm and over | 28,32 | 9,63 | | |
| Healthy Nutrition-Exercise Behavior | 150-160 cm | 40,94 | 7,72 | ,526 | 0,66 |
| | 161-170 cm | 40,82 | 9,18 | | |
| | 171-180 cm | 41,74 | 7,97 | | |
| | 181 cm and over | 39,93 | 11,76 | | |
| Unhealthy Nutrition-Exercise Behavior | 150-160 cm | 39,28 | 6,33 | 2,870 | 0,03* |
| | 161-170 cm | 39,39 | 8,49 | | |
| | 171-180 cm | 37,84 | 7,33 | | |
| | 181 cm and over | 35,80 | 8,47 | | |
| Meal Layout | 150-160 cm | 19,30 | 5,23 | 6,835 | 0,00* |
| | 161-170 cm | 18,15 | 5,61 | | |
| | 171-180 cm | 20,92 | 5,66 | | |
| | 181 cm and over | 18,74 | 8,02 | | |
| Nutrition-Exercise Behavior Scale Total | 150-160 cm | 130,75 | 15,36 | 1,491 | 0,21 |
| | 161-170 cm | 128,35 | 23,96 | | |
| | 171-180 cm | 130,74 | 19,49 | | |
| | 181 cm and over | 122,80 | 30,47 | | |

*p<0,05

When Table 8 was evaluated, it was determined that there was a significant difference between the height variable of the research group and the mean score of unhealthy diet-exercise behavior and meal order, which are sub-dimensions of the scale (p>0.05). It was observed that there was no significant difference between psychological/addictive eating behavior, healthy eating-exercise behavior mean score (p>0.05). It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension, unhealthy diet-exercise behavior and the height variable of the research group [t=2.870, p<.0.05]. According to the results of the analysis carried out to determine which groups these differences originate from, the mean scores of students with a height of 161-170 cm ($\bar{X}$=39.39) are 150-160 cm ($\bar{X}$=39.28), 171-180 cm ($\bar{X}$=37.84). ), 181 cm and above ($\bar{X}$=35.80), there is a statistical difference in favor of the students with a height between 161-170 cm between the mean scores of the students.

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension meal order and the height variable of the research group [t=6,835, p<.0.05]. According to the results

of the analysis performed to determine which groups these differences originate from, the mean scores of students with a height of 171-180 cm ($\bar{X}$=20.92) were 150-160 cm ($\bar{X}$=19.30), 181 cm and above ($\bar{X}$=18.74). ), 161-170 cm ($\bar{X}$= 18.15), it was determined that there is a significant difference in favor of the students with a height between 171-180 cm between the mean scores of the students.

**Table 9.** Analysis of Variance by Body Weight Variable of the Research Group

| | | ***Body Weight*** | | | |
|---|---|---|---|---|---|
| | | $\overline{X}$ | ***Sd*** | ***F*** | ***Sig*** |
| Psychological/Addicted Eating Habit | 50-60 kg | 30,29 | 6,74 | 1,653 | 0,16 |
| | 61-70 kg | 29,67 | 6,45 | | |
| | 71-80 kg | 31,22 | 6,86 | | |
| | 81-90 kg | 29,02 | 8,17 | | |
| | 91 kg and over | 33,00 | 8,38 | | |
| Healthy Nutrition-Exercise Behavior Scale | 50-60 kg | 41,34 | 8,00 | 1,873 | 0,11 |
| | 61-70 kg | 40,84 | 8,78 | | |
| | 71-80 kg | 41,40 | 9,62 | | |
| | 81-90 kg | 41,61 | 8,72 | | |
| | 91 kg and over | 35,00 | 9,99 | | |
| Unhealthy Nutrition-Exercise Behavior Scale | 50-60 kg | 39,93 | 7,13 | 4,318 | 0,02* |
| | 61-70 kg | 37,57 | 6,62 | | |
| | 71-80 kg | 37,87 | 9,83 | | |
| | 81-90 kg | 37,02 | 7,19 | | |
| | 91 kg and over | 43,42 | 9,70 | | |
| Meal Layout | 50-60 kg | 18,96 | 5,16 | 1,955 | 0,10 |
| | 61-70 kg | 19,00 | 6,00 | | |
| | 71-80 kg | 19,05 | 6,59 | | |
| | 81-90 kg | 20,97 | 5,57 | | |
| | 91 kg and over | 21,92 | 7,16 | | |
| Nutrition-Exercise Behavior Scale total | 50-60 kg | 130,54 | 19,27 | ,704 | 0,58 |
| | 61-70 kg | 127,09 | 19,62 | | |
| | 71-80 kg | 129,55 | 27,00 | | |
| | 81-90 kg | 128,63 | 23,62 | | |
| | 91 kg and over | 133,35 | 23,53 | | |

*p<0,05

When Table 9 was evaluated, it was determined that there was a significant difference between the body weight variable of the research group and the mean score of unhealthy diet-exercise behavior from the sub-dimensions of the scale (p<0.05), while the total and sub-dimensions of the scale of nutrition-exercise psychological/addicted eating behavior, healthy nutrition. It was determined that there was no significant difference between exercise behavior and meal order mean score (p>0.05).

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension, unhealthy diet-exercise behavior and the body weight variable of the research group [t=4.318, p<.0.05]. According to the results of the analysis carried out to determine which groups these differences originate from, the mean scores of students with a body weight of 91 kg and above ($\bar{X}$ =43.42), 50-60 kg ($\bar{X}$ =39.93), 71-80 kg ($\bar{X}$ =37, 87), 61-70 kg ($\bar{X}$ =37.57), 81-90 kg ($\bar{X}$ =37.02) body weight, there is a statistically significant difference in favor of students with 91 kg and above body weight.

**Table 10.** Analysis of Variance by Regular Exercise Status of the Research Group

| | | *Regular Exercise Status* | | | |
|---|---|---|---|---|---|
| | | $\overline{X}$ | *Sd* | *F* | *Sig* |
| Psychological/Addicted Eating Habit | Yes | 31,49 | 5,33 | 11,316 | 0,00* |
| | No | 28,25 | 8,19 | | |
| | Partly | 31,13 | 6,14 | | |
| Healthy Nutrition-Exercise Behavior | Yes | 46,08 | 7,84 | 39,891 | 0,00* |
| | No | 37,39 | 8,71 | | |
| | Partly | 41,25 | 7,72 | | |
| Unhealthy Nutrition-Exercise Behavior | Yes | 38,93 | 6,66 | 1,490 | 0,22 |
| | No | 37,89 | 8,85 | | |
| | Partly | 39,22 | 7,32 | | |
| Meal Layout | Yes | 19,38 | 5,23 | 14,935 | 0,00* |
| | No | 17,42 | 6,33 | | |
| | Partly | 20,56 | 5,30 | | |
| Nutrition-Exercise Behavior Scale Total | Yes | 135,89 | 16,99 | 21,922 | 0,00* |
| | No | 120,97 | 25,74 | | |
| | Partly | 132,17 | 17,76 | | |

*p<0,05

When Table 10 is examined, it was specified that there was a significant difference between the study group's regular exercise status and the total and scale sub-dimensions of the nutrition-exercise behavior scale, psychological/addicted eating behavior, healthy eating-exercise behavior, and meal order mean score (p<0.05). It was monitored that there was no significant difference between the unhealthy diet-exercise behavior mean scores of the sub-dimensions (p>0.05).

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension psychological/addictive eating behavior and regular exercise status of the research group [F=11.316, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the mean scores of the students who exercise regularly ($\bar{X}$=31.49), those who do partially ($\bar{X}$=31.13), and those who do not exercise regularly ($\bar{X}$=28.25) It was determined that there was a statistically significant difference in favor of the students.

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension, healthy eating-exercise behavior and regular exercise status of the research group [F=39,891, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the mean scores of the students who exercise regularly ($\bar{X}$=46.08), those who do partially ($\bar{X}$=41.25), those who do not exercise regularly ($\bar{X}$=37.39) It was seen that there was a statistical difference in favor of the students.

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension of the study group, healthy meal order and regular exercise [F=14.935, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the average score of the students who exercise regularly ($\bar{X}$=20.56), those who exercise regularly ($\bar{X}$=19.38), and the students who do not exercise regularly ($\bar{X}$=17.42) It has been determined that there is a statistical difference in favor of the students who exercise regularly.

It was determined that there was a significant difference between the nutrition-exercise scale and regular exercise status of the research group [F=21,922, p<.0.05]. According to the results of the analysis made

to determine which groups these differences originate from, the average score of the students who exercise regularly (X̄=135.89), those who do partially (X̄=132.17), those who do not exercise regularly (X̄=120.97), who do regular exercise It was seen that there was a statistical difference in favor of the students.

**Table 11.** Analysis of Variance by Perceived Economic Status of the Research Group

| | | *Perceived Economical Status* | | *F* | *Sig* |
|---|---|---|---|---|---|
| | | $\overline{X}$ | *Sd* | | |
| Psychological/Addicted Eating Habit | Low | 30,11 | 6,50 | 9,468 | 0,00* |
| | Medium | 29,59 | 6,33 | | |
| | High | 33,45 | 8,82 | | |
| Healthy-Nutrition Exercise Habit | Low | 39,40 | 9,14 | 7,626 | 0,00* |
| | Medium | 40,90 | 7,92 | | |
| | High | 44,42 | 10,36 | | |
| Unhealthy-Nutrition Exercise Habit | Low | 37,56 | 7,59 | 6,441 | 0,00* |
| | Medium | 38,48 | 6,93 | | |
| | High | 41,59 | 10,45 | | |
| Meal Layout | Low | 16,92 | 5,70 | 14,132 | 0,00* |
| | Medium | 19,67 | 5,85 | | |
| | High | 21,02 | 4,59 | | |
| Nutrition-Exercise Behavior Scale Total | Low | 124,00 | 20,58 | 13,955 | 0,00* |
| | Medium | 128,66 | 19,12 | | |
| | High | 140,49 | 28,28 | | |

*p<0,05

When Table 11 is evaluated, it has been observed that there is a significant difference between the perceived economic status of the research group and the total score of the nutrition-exercise behavior scale and the mean score of the scale sub-dimensions (p<0.05).

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension psychological/addictive eating behavior of the research group and the perceived economic status [F=9,468, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, there is a significant difference between the mean scores of students with high perceived income (X̄=33.45), low (X̄=30.11), and medium (X̄=29.59) students. It has been determined that there is a statistical difference in favor of students with a high perceived income level.

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension, healthy nutrition-exercise behavior and the perceived economic status of the research group [F=7.626, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, there is a significant difference between the mean scores of students with high perceived income (X̄=44.42), medium (X̄=40.90), and low (X̄=39.40) students. It has been determined that there is a significant difference in favor of students with a high perceived income level.

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension unhealthy diet-exercise behavior of the research group and the perceived economic status [F=6.441, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, there is a significant difference between the mean scores of students with high perceived income (X̄=41.59), medium (X̄=38.48), and low (X̄=37.56) students. It has been observed that there is a statistical difference in favor of students with a high perceived income level.

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension meal order and the perceived economic status of the research group [F=14,132, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, there is a significant difference between the mean scores of students with high perceived income ($\bar{X}$=21.02), medium ($\bar{X}$ =19.67), and low ($\bar{X}$=16.92) students. It has been determined that there is a statistically significant difference in favor of students with a high perceived income level.

It was determined that there was a significant difference between the nutrition-exercise scale of the research group and the perceived economic status [F=13.955, p<.0.05]. According to the results of the analysis carried out to determine which groups these differences originate from, there is a significant difference between the mean scores of students with high perceived income ($\bar{X}$=140.49), medium ($\bar{X}$=128.66), and low ($\bar{X}$ =124.00) students. It was found that there was a statistically significant difference in favor of students with high perceived income.

**Table 12.** Analysis of Variance by Weekly Exercise Status of the Research Group

| | | ***Weekly Exercise Status*** | | | |
|---|---|---|---|---|---|
| | | $\bar{X}$ | ***ss*** | ***F*** | ***Sig*** |
| Psychological/Addicted Eating Habit | 1 day | 29,35 | 7,02 | 5,352 | 0,00* |
| | 2 days | 31,82 | 7,33 | | |
| | 3 days | 29,45 | 4,52 | | |
| | 4 days and over | 32,17 | 7,34 | | |
| Healthy Nutrition-Exercise Behavior | 1 day | 37,71 | 7,45 | 29,159 | 0,00* |
| | 2 days | 44,46 | 8,76 | | |
| | 3 days | 44,73 | 7,36 | | |
| | 4 days and over | 43,36 | 10,11 | | |
| Unhealthy Nutrition-Exercise Behavior | 1 day | 37,86 | 7,36 | 2,995 | 0,03* |
| | 2 days | 39,55 | 8,89 | | |
| | 3 days | 38,68 | 5,73 | | |
| | 4 days and over | 41,06 | 8,92 | | |
| Meal Layout | 1 day | 18,33 | 6,09 | 6,873 | 0,00* |
| | 2 days | 20,15 | 5,50 | | |
| | 3 days | 19,04 | 5,70 | | |
| | 4 days and over | 22,00 | 3,84 | | |
| Nutrition-Exercise Behavior Scale Total | 1 day | 123,27 | 20,21 | 15,299 | 0,00* |
| | 2 days | 136,00 | 24,36 | | |
| | 3 days | 131,92 | 12,21 | | |
| | 4 days and over | 138,59 | 23,34 | | |

*p<0,05

When Table 12 is examined, it has been determined that there is a significant difference between the weekly exercise status of the research group and the total score of the nutrition-exercise behavior scale and the mean score of the scale sub-dimensions (p<0.05).

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension psychological/addictive eating behavior and weekly exercise status of the research group [F=5,352, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the average scores of the students who exercise four days a week or more ($\bar{X}$=32.17), two days ($\bar{X}$=31.82), three days ($\bar{X}$=29.45), one It has been determined that there is a statistical difference between the mean scores

of the students who exercise four days a week or more in favor of the students who exercise four days a week ($\bar{X}$=29.45).

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension, healthy eating-exercise behavior and weekly exercise status of the research group [F=29,159, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the average scores of the students who exercise three days a week ($\bar{X}$=44.73), two days ($\bar{X}$=44.46), four days and more ($\bar{X}$=43.36), one It has been determined that there is a statistical difference between the mean scores of the students who exercise three days a week ($\bar{X}$=37.71) in favor of the students who exercise three days a week.

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension, unhealthy diet-exercise behavior and weekly exercise status of the research group [F=2.995, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the average scores of the students who exercise four days a week or more ($\bar{X}$=41.06), two days ($\bar{X}$=39.55), three days ($\bar{X}$=38.68), one It has been observed that there is a significant difference between the mean scores of the students who exercise four days a week or more in favor of the students who exercise four days a week ($\bar{X}$=37.86).

It was determined that there was a significant difference between the nutrition-exercise scale sub-dimension meal order and weekly exercise status of the research group [F=6.873, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the average scores of the students who exercise four days a week or more ($\bar{X}$=22.00), two days ($\bar{X}$=20.15), three days ($\bar{X}$=19.04), one It has been determined that there is a statistical difference in favor of the students who exercise four days a week or more between the mean scores of the students who exercise daily ($\bar{X}$=18.33).

It was determined that there was a significant difference between the nutrition-exercise scale and the weekly exercise status of the research group [F=15,299, p<.0.05]. According to the results of the analysis made to determine which groups these differences originate from, the average scores of the students who exercise four days a week or more ($\bar{X}$=138.59), two days ($\bar{X}$=136.00), three days ($\bar{X}$=131.92), one It has been observed that there is a statistically significant difference between the mean scores of the students who exercise for four days a week ($\bar{X}$=123,27) in favor of the students who exercise four days a week or more.

**Table 13.** Pearson Correlation Analysis of the Research Group's Gender and Nutrition-Exercise Behavior Scale and its Sub-Dimensions

| | | **Gender** | **Psychological/Addicted Eating Habit** | **Healthy-Nutrition-Exercise Behavior** | **Unhealthy-Nutrition-Exercise Behavior** | **Meal Layout** | **Nutrition-Exercise Behavior Scale Total** |
|---|---|---|---|---|---|---|---|
| Gender | r | 1 | -,020 | -,029 | ,045 | ,008 | ,000 |
| | p | | ,654 | ,514 | ,306 | ,860 | ,993 |
| Psychological/Addicted Eating Habit | r | -,020 | 1 | ,395** | ,553** | ,246** | ,747** |
| | p | ,654 | | ,000 | ,000 | ,000 | ,000 |
| Healthy Nutrition-Exercise Behavior | r | -,029 | ,395** | 1 | ,474** | ,366** | ,802** |
| | p | ,514 | ,000 | | ,000 | ,000 | ,000 |
| Unhealthy Nutrition-Exercise Behavior | r | ,045 | ,553** | ,474** | 1 | ,195** | ,783** |
| | p | ,306 | ,000 | ,000 | | ,000 | ,000 |
| Meal Layout | r | ,008 | ,246** | ,366** | ,195** | 1 | ,568** |
| | p | ,860 | ,000 | ,000 | ,000 | | ,000 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Nutrition-Exercise Behavior Scale Total | r | ,000 | ,747** | ,802** | ,783** | ,568** | 1 |
| | p | ,993 | ,000 | ,000 | ,000 | ,000 | |

When Table 13 was evaluated, it was determined that there was a positive and highly significant relationship between gender and the nutrition-exercise behavior scale and its sub-dimensions (p>0.05).

**Table 14.** Regression Analysis of the Research Group's Prediction of Gender and Nutrition-Exercise Behavior Scale

| Independent Variable | Dependent Variable | *B* | *Std. Error* | *β* | *t* | *P* | *R* | *R²* | *F* | *P* |
|---|---|---|---|---|---|---|---|---|---|---|
| Gender | Nutrition-Exercise Behavior | 1,613 | ,132 | ,000 | 12,219 | 0,00 | ,000 | ,000 | ,000 | *0,00* |

When Table 14 was assessed, it was determined that there was a significant and positive relationship between gender and nutrition-exercise behavior scale according to the results of the regression analysis (p<0.05).

**Table 15.** Pearson Correlation Analysis of the Nutrition-Exercise Behavior Scale and its Sub-Dimensions with the Program the Research Group Attended

| | | *Program that you Attend* | *Psychological/ Addicted Eating Habit* | *Healthy Nutrition-Exercise Behavior* | *Unhealthy Nutrition-Exercise Behavior* | *Meal Layout* | *Nutrition-Exercise Behavior Scale Total* |
|---|---|---|---|---|---|---|---|
| Program that you Attend | r | 1 | -,180** | -,158** | -,129** | -,060 | -,185** |
| | p | | ,000 | ,000 | ,003 | ,174 | ,000 |
| Psychological/Addicted Eating Habit | r | -,180** | 1 | ,395** | ,553** | ,246** | ,747** |
| | p | ,000 | | ,000 | ,000 | ,000 | ,000 |
| Healthy Nutrition-Exercise Behavior | r | -,158** | ,395** | 1 | ,474** | ,366** | ,802** |
| | p | ,000 | ,000 | | ,000 | ,000 | ,000 |
| Unhealthy Nutrition-Exercise Behavior | r | -,129** | ,553** | ,474** | 1 | ,195** | ,783** |
| | p | ,003 | ,000 | ,000 | | ,000 | ,000 |
| Meal Layout | r | -,060 | ,246** | ,366** | ,195** | 1 | ,568** |
| | p | ,174 | ,000 | ,000 | ,000 | | ,000 |
| Nutrition-Exercise Behavior Scale Total | r | -,185** | ,747** | ,802** | ,783** | ,568** | 1 |
| | p | ,000 | ,000 | ,000 | ,000 | ,000 | |

When Table 15 was evaluated, according to the results of the regression analysis, it was determined that there was a significant and positive relationship between the program he/she studied and the nutrition-exercise behavior scale (p <0.05).

**Table 16.** Regression Analysis of the Research Group on the Prediction of the Learning Program and the Nutrition-Exercise Behavior Scale

| Independent Variable | Dependent Variable | B | Std. Error | β | t | p | R | R² | F | *P* |
|---|---|---|---|---|---|---|---|---|---|---|
| Attending Program | Nutrition-Exercise Behavior | 2,055 | ,133 | -,185 | 15,431 | 0,00 | ,185 | ,034 | 17,979 | *0,00* |

When Table 16 was evaluated, according to the results of the regression analysis, it was determined that there was a significant and positive relationship between the program she studied and the nutrition-exercise behavior scale ($p < 0.05$).

## Discussion and Conclusions

Modern civilizations' exercise and dietary habits have changed as a result of rising living levels and technology. The years spent in college are particularly the time when these shifts are felt the greatest. It is unknown, though, how these modifications to students' eating and exercise routines would impact their daily lives. In this setting, it's crucial for people to adopt good living habits, especially while they're in college.

The research revealed that while there was no gender difference in the research group's average nutrition-exercise score, female students' average nutrition-exercise score was greater than that of male students. According to the program that the research group participated in, it was found that faculty students scored better on average on the nutrition-exercise scale than college students did. It was noted that there was a statistically significant difference between the average nutrition-exercise score of the students who got nutrition instruction and the students who did not. It was shown that the students with chronic diseases had higher overall average scores on the nutrition-exercise behavior scale, and there was a strong correlation between the chronic illness status and the scale sub-dimensions. It was discovered that the research group's average nutrition-exercise scores were greater than those of the other groups for students weighing 91 kg or more. There was a statistically significant difference between the students in the research group who had high perceived economic status and those who did not, with the former having higher average scores across the board on the nutrition-exercise behavior measure. The gender of the research group, the program they are looking at, and the nutrition-exercise behavior measure have all been found to have a positive and substantial link. According to Yurt and Özdemir (2020), there was no statistically significant difference between the nutrition exercise scale for men and women, the general health status was not at the desired level, and the nutrition exercise scale was consistent with the people's perceptions of nutrition and exercise. Their study examined the nutritional exercise behaviors of university students. Park et al., (2013) revealed that there was no significant relationship between the nutritional environment at the school, healthy eating habits and the weight status of the students, but students with high income, low weekly screen time (TV watching), and women with housewife parents. It was stated that students' healthy eating scores were higher. Aykut et al., (2021), in their study, students; They determined that there was no significant difference between the gender variable and nutritional exercise behavior and that as the body weight increased, the Psychologically dependent eating behavior style increased. In their study, Erkensiz et al., (2020) determined that the healthy lifestyle behaviors of medical faculty students were moderate. Male students had a higher mean score in the nutrition exercise scale sub-dimensions than female students, and the nutritional exercise behaviors and attitudes of the research group were at a moderate level, according to the Kalay and Turkmen high school students who evaluated the factors affecting their eating and exercising behaviors. According to Erdogan and Mutlu Bozkurt's study from 2022, students in physical education and sports college and sports high school have a modest degree of healthy life skills. In their study, Tizar et al. (2022) found that the research group's views and levels of nutritional awareness were modest. In their study on the nutritional exercise and knowledge levels of teenagers, Kartal et al. (2019) found that psychological eating behavior reduces and physical activity improves as nutritional knowledge grows. According to Hendekçi and Aydn Avc (2020), the students' exercise and nutritional habits are influenced by the educational attainment, dietary habits, and housing situation of their parents. showed that they had a good impact.

In comparison to the students in the other group, it was found that the research group's regular exercisers had better average scores across all sub-dimensions of exercise-nutrition, whereas the group of students who were unable to exercise consistently had the lowest average score. It has been noted that the

average scores for the total and all sub-dimensions of the nutrition-exercise behavior scale are higher and statistically significant for the research group students who exercise four or more days per week as compared to the students in the other groups. The bulk of the research group's participants were found not to frequently exercise. Ağar and Sohbet (2020) stated in their study that university students have moderately healthy lifestyle behaviors, do not exercise regularly and do not pay attention to their nutritional status. Arıcan (2021), in his research, determined that the majority of the participants exercise 1-3 days a week, and that healthy lifestyle behaviors differ according to age, gender, department of education and exercise status. King et al., (2007) examined the participation of university students in healthy nutrition and exercise, and they determined that 40.3% of the students (they do exercise 4 days or more a week, and being healthy and losing weight are among the reasons for exercising. Albayrak Yaman and Ünal (2021) determined that the majority of their students do not exercise regularly and that 69.6% of students with low BMI do not regularly take part in any exercise program. Besides, they specified that the students learned about health/nutrition from internet/social media sources in general. In their study, Erdoğan et al. (2021) reported that the pre-service teachers in the research group had insufficient healthy eating habits and regular physical activity. Huang et al., (2003) in their study in which they determined the obesity, overweight, Nutrition and physical activity status of university students, stated that the students generally did less than 3 days of physical activity a week and the majority of them did not meet the physical activity and nutrition guidelines. In their study, Vural and Bakır (2015) determined that the healthy lifestyle behaviors of university students were moderate and the majority of them did not exercise regularly. In their study, Yaşar et al., (2018) found that students' healthy lifestyle behaviors were moderate, male students had higher physical activity averages than female students, income status affected healthy lifestyle behaviors, and chronic illness status was more likely to take responsibility for health. have stated that they are affected. In their study, Bebiş et al., (2015) determined that the majority of the participants did not regularly do sports outside of physical education class, and they stated that the reason for this was the participants' future anxiety. In the study conducted by Erdoğan et al., (2022), they determined that the nutritional habits and physical activity levels of university students were insufficient. In study of Kostak et al., (2014) they evaluated the healthy lifestyle behaviors of nursing and classroom teaching department students, and found that the majority of the students do not do sports whenever they have the opportunity or not at all and the health status, gender, level of success of the students and the department they study in are effective on healthy lifestyle behaviors. El Gilany et al. (2011) found that the study's levels of physical activity were insufficient, and they attributed this to the fact that the family's socioeconomic status, the medical training they received, the lack of membership in a sports team, and the fact that the participants were female were the biggest barriers to participating in physical exercise.

The average nutrition exercise score of female students was higher than that of male students, and the average score of students studying at the faculty was higher than the students studying at the college. As a result, it was observed that the nutritional exercise behaviors of university students were at a moderate level. The gender of the students, the program they were enrolled in, and the nutrition exercise behavior scale were shown to be significantly positively correlated. Additionally, it was noted that the majority of pupils did not engage in regular exercise. The organization of educational activities regarding the advantages of physical activity, the inclusion of exercise and physical activity programs, and the development of educational activities for college students to acquire good living habits are all advised.

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# Examining the Effects of Using Educational Games in 6th Grade Algebra Teaching on Students' Academic Achievement and Attitudes

*Research Article*

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ABSTRACT

This study aims at the effect of teaching algebraic expressions in the algebra learning field of the 6th-grade Mathematics curriculum using educational games on students' academic success and attitudes. The research was carried out with a random sampling method in a public secondary school in the Black Sea Region of Turkey in the 2022-2023 academic year, with a total of 47 students, 23 in the experimental group and 24 in the control group, in two branches studying at the sixth-grade level. During the study, while no intervention was made to the control group, five educational games developed by the researcher were applied to the experimental group in addition to the existing curriculum methods. The mixed method, in which both quantitative and qualitative methods are used together, was used in the study. The research was carried out according to the explanatory design method, which is one of the mixed design types. Quantitative data were collected using the "Algebraic Expressions Achievement Test (CIBT)" developed by Oduncu (2020) in his master's thesis and the "Math Attitude Scale" developed by Önal (2013). A semi-structured interview form was used to collect qualitative data. The t-test method was used for independent samples of the obtained quantitative data. In the analysis of qualitative data, the descriptive analysis method was used. When the achievement and attitude post-test scores were compared in the analysis, a statistically significant difference was found in favor of the experimental group. As a result of the research, it can be said that using educational games in mathematics teaching positively affects academic achievement and attitude toward mathematics lessons. In the interviews with the students, they stated that they learned the subject of algebraic expressions better with the games played and understood the subjects better. According to this result, it is recommended that mathematics teachers design and use educational games in accordance with the grade level and subject.



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**Keywords:**
Educational Game, Algebra Teaching, Academic Success, Mathematics Attitude

## Introduction

Today, with the development of technology and science, teaching methods are also developing and changing. With this aspect, teachers and students should prefer new teaching methods and techniques for these different needs in education (Arslan, Kutluca & Özpınar, 2011; Kiryakova, Angelova, & Yordanova, 2014). Since it is known that individuals are happier and learn more quickly when they actively participate in learning, environments should be created that will enable students to access information by doing and experiencing instead of giving mathematics information to students by teachers (Sönmez, 2012). Although the needs of students of every age group are different, the educational and educational contribution of games and game-like formations has been proven by research, especially in primary and secondary school students (Okur & Koca-Akkuş, 2021; Uğurel & Moralı, 2008). In this direction, one of these methods and techniques, which aims to focus on the students as the primary purpose, which is based on the development of qualities such as permanence and creativity after a long process, and which aims to have a more enjoyable interaction, is to use educational games (Lee & Hammer, 2011; Wood & Reiners, 2015; Aslan, Turgut, & Karakuş-Yılmaz, 2022). Teachers' use of games in the classroom environment affects the perspectives of the children on the school and mathematics (Turgut & Temur, 2017). One of the objectives of mathematics instruction with games is to improve the love of the students for mathematics and to allow them to develop positive attitudes toward mathematics (İlhan, 2021). Thus, the active participation of the students who are more interested in and love mathematics would be possible, and their achievements could increase (Biriktir, 2008). Today, supporting the lesson with educational games is a part of education-teaching life. It is thought that students can be successful in thoroughly evaluating their energies, focusing processes and playing potential, and in directing these features to learning activities, with instruction supported by educational games, and this situation can positively contribute to students' being successful individuals in their academic and social lives (Lee & Hammer, 2011). When the literature is examined, it has been determined that there are studies showing that supporting the lessons with educational games affects the success and attitudes of the students, attracts the attention of the students, increases their focus time, and makes it easier to understand the subject being studied (Açıkgöz, 2005; Bayram, 2006; Barata, Gama, Jorge & Gonçalves, 2013; O'Donovan, Gain, & Marais, 2013; Mekler, Brühlmann, Opwis, & Tuch, 2013; Hanus & Fox, 2015; Terzi, Küçük-Demir, 2022).

Considering that the mathematics course consists of abstract concepts and that the students of primary school age are mostly just starting the abstract processing period, students have difficulty in learning mathematical concepts. One of them is algebra, which is a sub-field of mathematics and the basic concepts of algebra. Some of the students do not see algebra as an immediate need to be learned, such as performing arithmetic operations, reading and writing (Dede & Peker, 2007). This situation causes students not to understand advanced mathematics lessons, to academic failure and to develop negative attitudes towards mathematics (Williams, 1997; Hostovecky & Novak, 2017; Yorulmaz & Doğan, 2019). Considering that games help students to concretize abstract concepts in their minds, it can be stated that the use of educational games especially in mathematics lessons will contribute to students' positive perception of mathematics (Türkmen, 2017; Yeşilkaya, 2013). According to Bolat (2018), educational games are a very effective technique for concretizing abstract subjects and in achieving the objectives of the lesson. Thanks to the advantages of educational games, the interest in the use of games in mathematics teaching have increased (Çelik, 2013; Usta et al., 2017). The statement of J. C. Guts Muths, "The educator approaches the child through play, permeates his soul, wins hearts easily," has been the inspiration for this research.

**The Problem of Research**

What is the effect of teaching algebraic expressions in the algebra learning field of the 6th-grade math curriculum with educational games on students' mathematics achievement and their attitudes towards mathematics? This question constitutes the problem sentence of this study.

**Purpose of the research**

The purpose of this research is to examine the students' mathematics achievement and their attitudes toward mathematics when the subject of algebraic expressions in the algebra learning field of the 6th-grade Mathematics curriculum is taught using educational games. For this purpose, "What is the effect of teaching the subject of algebraic expressions in the algebra learning field of the 6th-grade mathematics curriculum with the use of educational games on students' mathematics achievement and their attitudes towards mathematics? An attempt was made to answer the question with the questions given below.

**Sub-Aims Regarding Quantitative Data:**

- Is there a significant difference between the student's achievements in the experimental group and the control group students, who are taught by using the educational game about the subject of algebraic expressions in the algebra learning field of the 6th-grade Mathematics curriculum?
- Is there a significant difference between the attitudes of the experimental group students and the control group students, who were taught by using educational games, about algebraic expressions in the algebra learning field of the 6th-grade Mathematics curriculum?

**Sub-Aims Regarding Qualitative Data:**

- What are the students' views on the teaching process of using educational games on algebraic expressions in the algebra learning field of the 6th-grade Mathematics curriculum?

**Research Method**

The study used a design in which quantitative and qualitative research methods, called mixed methods, were used together. The research was carried out according to the explanatory design method, one of the mixed design types. The explanatory pattern consists of two stages. The first of these is the collection and analysis of quantitative data, and the second is the collection and analysis of qualitative data to investigate quantitative data in detail (Büyüköztürk et al., 2008). In order to collect the quantitative data of the study, the pretest-posttest, one of the experimental designs, was carried out within the framework of quasi-experimental designs with the control group. Semi-experimental designs are generally used in social sciences when they cannot be controlled as much as accurate experimental designs (Karasar, 2003). Semi-structured interview technique was used to collect qualitative data, which was carried out to support and explain the results obtained from the quantitative data. During the study, only the methods in the current curriculum were applied to the control group, while five educational games developed by the researcher were applied to the experimental group in addition to the existing curriculum methods. An example of the educational games used in the lesson is given in Figure 1.


**Figure 1.** Some of the educational games used in the research

**Study group**

The research was carried out with a random sampling method in a state secondary school in the Black Sea Region of Turkey in the 2022-2023 academic year, with a total of 47 students, 23 in the experimental group and 24 in the control group, in two branches studying at the sixth grade level. Experimental and control groups were selected randomly. In the study group in the qualitative dimension of the research, 9 students were selected randomly from 23 students in the experimental group and interviews were made.

The research was carried out with a random sampling method in a state secondary school in the Black Sea Region of Turkey in the 2022-2023 academic year, with a total of 47 students, 23 in the experimental group and 24 in the control group, in two branches studying at the sixth-grade level. Experimental and control groups were selected randomly. In the study group in the qualitative dimension of the research, nine students were selected randomly from 23 students in the experimental group, and interviews were conducted.

**Data Collection Tools**

In this study, CIBT, developed for the master's thesis in Okuducu (2020) as a pre-test-post-test to measure the knowledge of 6th-grade students, was used as a data collection tool. As a result of the achievement test application, item analysis was performed, the items that needed to be eliminated or corrected were determined and the test took its final form. For each question with a correct answer, "1 point" was scored, and the answer to the wrong or blank question was scored as "0 point".

The Attitude Scale towards Mathematics Lesson developed by Önal (2013) to measure the effect of educational game use on students' attitudes toward mathematics consists of 22 items, 11 of which are positive and 11 of which are harmful. The scale was developed by conducting validity and reliability studies on 311 6th, 7th and 8th-grade students. The Cronbach Alpha value of the scale, which has four factors: interest, anxiety, work and necessity, was calculated as 0.90. The scale was arranged in a 5-point Likert type as “strongly agree”, “agree”, “undecided”, “disagree”, and “strongly disagree”.

In addition, four questions in the interview form were prepared for nine randomly selected students from the experimental group to determine the effect of educational game-supported teaching on algebraic expressions in the algebra learning field of the 6th-grade Mathematics curriculum. While preparing the questions, studies on the subject were searched in the literature. The prepared questions were given their final form by taking the opinions of 3 faculty members who are experts in their fields.

**Collection and Analysis of Data**

Data were collected from Algebraic Expressions Achievement Test and Mathematics Attitude Scale. The obtained data were analyzed in SPSS 21 package program. In order to analyze the academic achievement and attitude scale pre-test and post-test scores of the students in the experimental and control groups, a t-test was applied for independent groups. The arithmetic means, standard deviation, t-score and p-score values obtained as a result of these analyzes were examined and findings related to the sub-problems were formed. Qualitative research data were collected with the interview form in which the student's opinions about the lesson taught with the educational game were taken. The descriptive analysis method was used in the analysis of the interview questions. First, the interview questions answers were divided into specific codes. Codes were determined separately for each question in the interview forms. These codes were brought together, and frequencies and percentages were determined by creating scoreboard tables.

**Findings**

As the main problem in this part of the research;

**1.** Is there a statistically significant difference between the achievements and attitudes of using educational games about algebraic expressions in the algebra learning field of the 6th-grade math curriculum in the experimental and control groups?

**2.** What are the students' views on the teaching process of using educational games on algebraic expressions?

The findings obtained from analyzing the data collected to seek answers to the questions are presented.

Before the application, the achievement test was applied to the experimental and control groups as a pre-test. At the end of the application, a post-test was conducted. Since the research data provided the t-test assumptions for independent samples, this test was deemed appropriate. The achievement test results of the scores obtained by the students from the pre-test and post-test are presented in Table-1.

**Table 1.** T-Test Results of the Mathematics Achievement Test Pre-Test and Post-Test Scores of the Groups

| | Group | *N* | Mean | *S* | *t* | *sd* | *P* |
|---|---|---|---|---|---|---|---|
| Pre-test | Experiment group | 32 | 12,18 | 7,112 | 2,237 | 55 | 0,174 |
| | Control group | 33 | 12,44 | 3,770 | | | |
| Final-test | Experiment group | 32 | 23,31 | 6,266 | 2,521 | 65 | 0,023 |
| | Control group | 33 | 19,76 | 8,412 | | | |

When Table 1 is examined, the pre-test achievement scores of the group taught with educational games (X=12.18) and the group taught with the traditional method (X=12.44), according to t(2,237)= 0.174, p>0.05 there appears to be no significant difference. When the achievement test scores based on the last application were examined, the post-test achievements of the group taught with educational games (X=23,31) and the group taught with the current teaching (X=19.76) were determined according to t(2,521)= 0.023, p<0.05. there is a significant difference. In light of these data, teaching using game-supported teaching on algebra subjects applied in the experimental group is more effective than teaching with traditional methods applied in the control group. The mathematics attitude test results of the students' pre-test and post-test scores are presented in Table 2.

**Table 2.** T-Test Results of the Groups' Mathematic Attitude Pre-Test and Post-Test Scores

| | Group | *N* | Mean | *S* | *t* | *sd* | *P* |
|---|---|---|---|---|---|---|---|
| Pre-test | Experiment group | 32 | 103,09 | 13,561 | | | |
| | Control group | 33 | 100,65 | 16,950 | 0,444 | 62 | 0,744 |
| Final-test | Experiment group | 32 | 119,06 | 10,304 | 3,011 | 65 | 0,014 |
| | Control group | 33 | 111,31 | 12,606 | | | |

When Table 2 is examined, there is a significant difference between the pre-test attitude scores of the group taught with educational games (X=103.09) and the group taught by the traditional method (X=100.65), according to t(0.444)= 0.744, p>0.05. there is no difference. When the achievement test scores based on the last application were examined, the difference between the post-test attitudes of the group taught with educational games (X=119.06) and the group taught with traditional learning method (X=111.31), t(3.011)= 0.014, p<0.05' There appears to be a significant difference concerning In the light of these data, it can be said that teaching using game-supported teaching on algebra subjects applied in the experimental group has a more positive effect on mathematics attitudes than teaching with traditional methods applied in the control group.

The findings regarding the analysis of the data obtained from the semi-structured interviews conducted with nine students from the experimental group are given in Table 3 below. Table 3 shows the answers given by the experimental group students to the semi-structured interview questions and the frequency and

percentage values of these answers in order to seek an answer to the question of the research "What are the opinions of the experimental group students at the end of the application of the educational game on algebraic expressions?"

**Table 3.** Frequency Values and Percentile Ratios of the Semi-Structured Interview About Positive or Negative Opinions About Using Educational Game on Algebraic Expressions

| Interview Questions | Answers | f | % |
|---|---|---|---|
| Do you have positive or negative thoughts about using educational games for algebraic expressions? If so what is it? | It makes the lesson fun. | 8 | 90 |
| | I enjoyed listening to the lecture. | 8 | 90 |
| | I learned and understood a lot more. | 7 | 75 |
| | I found out by myself. | 6 | 65 |
| | More solution oriented | 5 | 55 |
| | An activity-packed lesson | 6 | 65 |
| | The subject seems easy. | 1 | 10 |
| | I have no negative thoughts. | 1 | 10 |
| | While doing some activities, there is a noise, everyone stands up. | 2 | 25 |

When Table 3 is examined, eight students who participated in the interview stated that they like using educational games about algebraic expressions. While eight students said using educational games about algebraic expressions was fun, eight said they enjoyed the lesson. The number of students who said that they understood and learned more and better is 7. 6 students said, "I learned by finding it myself", five answered as solution-oriented, and six said it was an activity-packed lesson. According to Table 3, 2 students expressed negative thoughts. Two of the students stated that there was a noise during the activity, everyone stood up, and 1 of them stated that they found the lessons to be handled in this way at an elementary level. When we look at the students' answers, very few of them used negative statements. When we look at this table, most students stated that the lessons were memorable, they learned more, they learned better, and they were fun. The frequency values and percentages of the semi-structured interview about using educational games while the students are teaching other subjects in mathematics are given in Table 4 below.

**Table 4.** Frequency Values and Percentile Ratios of Semi-Structured Interviews About Using Educational Games While Teaching Other Subjects in Mathematics

| Interview Questions | Answers | f | % |
|---|---|---|---|
| Would you like to use educational games while covering other topics in math? Why | Yes, I would. | 8 | 90 |
| | I do not want. | 1 | 10 |
| | Very fun and beautiful. | 8 | 90 |
| | I am learning better. | 7 | 75 |
| | It gets my attention more. | 7 | 75 |
| | Subjects are closer to life | 3 | 35 |
| | We learn by playing with friends. | 3 | 35 |

When Table 4 is examined, 8 of the students who participated in the interview stated that they wanted to use educational games while teaching other subjects in mathematics, and one did not. Several students said "Lessons are fun and good" about using educational games about algebraic expressions. These seven students said "I learned more and better", seven students said "I am more interested", and "We learned by playing with friends" 3. Most students stated that the lessons were memorable, the subjects were close in life, and they produced something themselves. The frequency values and percentages of the semi-structured interview about the attitude towards the mathematics lesson of the use of educational games about algebraic expressions are given in Table 5 below.

**Table 5.** Frequency Values and Percentile Ratios of Using Educational Game on Algebraic Expressions of Semi-Structured Interview About Attitudes Towards Mathematics Lesson

| Interview Questions | Answers | f | % |
|---|---|---|---|
| Has the use of educational games on algebraic expressions affected your attitude towards mathematics? | Yes, it affected a lot. | 8 | 90 |
| | No, it didn't affect much. | 1 | 10 |
| | I loved math class, I started to like it more. | 5 | 55 |
| | I didn't like the math lesson very much, it made me love it even more. | 3 | 35 |

When Table 5 is examined, eight students who participated in the interview stated that using educational games about algebraic expressions positively affected their attitude towards the mathematics lesson. One stated that it did not affect their attitude. Most students said they liked the mathematics lesson and started liking it more. In addition, two students stated that they did not like the mathematics lesson very much, but it helped them to like it more.

## Results and Recommendations

Mathematics lesson has an abstract structure. For this reason, it is thought to be challenging to learn, and it is essential to know the concepts and, more importantly, what they will do (Dede & Argün, 2004). The content of the mathematics course has a spiral structure. The teaching of algebra is one of the leading learning areas and fundamental subjects in secondary and high school. Teaching algebra coincides with when middle school 6th-grade students begin to think abstractly. Considering the effect of students' active participation and attitudes on their learning, using the game's power comes to mind. Students become more active in learning algebra topics supported by educational games and take responsibility for their learning. However, with the pleasure and fun of the game, it can be ensured that their attitudes toward the mathematics lesson are improved positively. This study aimed to determine the effect of 6th-grade algebra teaching on students' mathematics achievement and attitudes toward mathematics lessons by performing educational games.

For his findings on mathematics achievements, A pre-test was given to the experimental and control group students. As a result of the independent group's t-test performed between the pre-test achievement scores, it was seen that there was no statistically significant difference between the groups. The fact that there was no significant difference in the pre-test achievement scores of the students in the experimental and control groups indicates that the application was made with similar groups in terms of success. The fact that there was a significant difference between the pre-test and post-test scores of the experimental group and control group students in the achievement test suggests that both groups achieved the achievements given in the course. When the average of success of the groups at the beginning of the application is examined, the fact that the average of the students in the experimental group increased more than the average of the students in the control group can lead to the conclusion that the use of educational games in algebra teaching affects success more positively.

It is seen that the results of this research and the results of the related studies in the literature are mainly similar and it has been concluded that the use of educational games affects academic achievement positively in related studies (Çuha, 2004; Dinçer, 2008; Ke, 2008; Gökçen, 2009; Aksoy, 2010; Bahrami). et al., 2012; Canbay, 2012; Bozoğlu, 2013; Demir, 2016; Çetin, 2016;Thiruchelvam, 2018; Çalışkan, 2019; Tükle, 2020). Tuncer (2008) also compared material-supported mathematics teaching with the traditional teaching method and revealed that students who received material-supported education were more successful. Again, investigating the effect of visual material on success, Körükçü (2008) found that the success levels of students who used visual materials in the teaching process differed positively. The mental development of students is supported by playing games in the learning process (MEB, 2006). In this research, playing educational games related to the subjects of the algebra learning field enabled students to gain experience in algebraic knowledge

and skills actively. In addition, thanks to the games played, abstract algebra concepts were embodied and associated with daily life. Thus, it is thought that students comprehend algebra subjects more quickly and are more successful in these subjects. On the other hand, some research results do not show parallelism with the results of these studies. In a study conducted by Zuskin (1994), the Mathematics achievements of 7th-grade students who played games or used worksheets in the Mathematics lesson were compared and no difference was found.

A post-test was applied to the experimental and control groups to determine their mathematical attitudes. In the post-test results, it was observed that there was a statistically significant difference between the experimental and control groups in favor of the experimental group. In this situation, It is interpreted that the teaching carried out using educational games applied to the experimental group has a more positive effect than the current curriculum teaching methods applied to the control group. When it was examined whether there was a significant difference between the pre-test and post-test attitude scores of the experimental group and the control group towards the mathematics lesson, it was observed that there was a significant difference between the mathematics lesson attitude pre-test and post-test scores of the students in the experimental group. In this case, it can be said that the teaching method with educational games applied to the experimental group positively affects the attitude towards the mathematics lesson.

In the literature, it is stated that the practices supported by games cause a significant difference in student's attitudes toward the lesson and the research results show parallelism (Aksoy, 2010; Kavasoğlu,2010; Çetin, 2016; Güneş, 2010; Kılıç, 2007; Özgenç, 2010; Yang & Tsai, 2010). Some research results do not show parallelism with the results of these studies. Yılmaz (2019) stated that there was no significant difference in the attitudes of primary school students towards the mathematics lesson when teaching with games was used to examine their problem-solving skills. The presence of mathematical problems in the games and the weight of the mathematical content in the game can reduce the level of pleasure from the game. The knowledge creation rate through games should remain low; otherwise, the probability of returning to an informational competition will increase. Çalışkan (2019) stated that there is no significant difference in the attitudes of 2nd-grade students towards the lesson when they learn about rounding and estimating with games. The possibility that the application period was not long enough and that the application group did not fully gain the ability to express themselves may have led to this result.

Another result obtained in the research is that, as a result of semi-structured interviews with nine students selected from the experimental group, it has been determined that the lessons using educational games on algebraic expressions are more fun and exciting. It was also stated that it increased the students' time to focus on the lesson, the concepts were learned concretely, the students were more active in the lessons, the lessons were more permanent, and it positively affected the student's attitudes towards the mathematics lesson. Using educational games on algebraic expressions, 90% of the students liked the math lesson more. As a result of the semi-structured interviews, it was concluded that the majority of the students were positive towards the use of educational games on algebraic expressions and they wanted other subjects of the mathematics course to be taught with the help of educational games; Çankaya and Karamet (2008) and Şahin (2016) reached similar findings with this study in their studies. The results obtained to support this study. When we look at this table, most students stated that the lessons were memorable, they learned more, they learned better, and they were fun.

As a result, it can be said that educational games prepared for teaching algebra positively affect students' academic achievement and attitudes toward mathematics. In the interviews, students also stated that the lessons were more fun, they understood better, and the lessons were more memorable. They learned more by using educational games on algebraic expressions. Math games allow students to explore basic

mathematical concepts such as computational strategies and place values. It also helps students to deepen their mathematical understanding and reasoning (Rutherford, 2015).

For this reason, it can be said that games should not be seen as a tool where children spend their time out of school but should be used as an essential teaching method that allows children to access such information. Suppose educators prefer to use instructional management with games. In that case, they prefer games that require the use of concrete materials and that will activate more basic senses of the students. In addition, it can be suggested to examine experimental studies using educational games with other sub-fields among the subjects in other algebra teachings in mathematics, especially at the secondary school level, where abstract thinking begins.

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# Pre-School Teachers' Human Nature Concepts and Teaching Practices

*Research Article*

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ABSTRACT

The concept of human nature has been in the centre of philosophy for a very long time. From ancient times to the postmodern world, people have sought to understand the nature of humanity. Different schools and thoughts in philosophy were in consistency with their definitions of human nature. The concept holds its significance for education, too for various learning theories take up humanity from different perspectives. With those in mind, the study seeks a relevance – if any – between teachers' concepts of human nature and their teaching practices. The study was designed as a qualitative phenomenological study. The participants of the study consist of 5 female pre-school teachers. Semi-structured interviews and observations were implemented to understand whether teachers' concepts of human nature direct their teaching practices. The findings suggest that there is a close link between pre-school teachers' human nature concepts and their teaching practices.



**Keywords:**
human nature, educational philosophy, pre-school teachers, teaching practice

## Introduction

Although education is not a branch of science itself, it is a multidisciplinary area in relation with many fields. Besides those fields such as sociology, economy, politics, environment and so forth, philosophy is laid at the core of this discipline. Philosophical foundations, concepts and beliefs affect the practice of education directly (Bim-Bad, 2016; Brownlee, Scholas, Walker &Johansson, 2016).

The relationship between philosophical beliefs and practice for education are discussed under four options: i. beliefs affect practices, ii. practices affect beliefs, iii. beliefs are not aligned with practices, and iv. complex and bi-directional relationships (Brownlee, Scholas, Walker & Johansson, 2016). For educational practice and philosophy, the fourth option seems to be compatible. As the basement of education, philosophy shapes and directs educational practices.

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Besides this effect, the change in educational philosophy through time signals the effect of educational practice on educational philosophy. Descartes saw the effectiveness of experiments on learning and constructed an empirical philosophy of education while Rousseau regarded educational philosophy in a naturalistic way. As a result, the arrow of effect between philosophy and practice for education seems to be bidirectional and complex. This situation leads us to start thinking about the philosophy of education and the concepts affecting education directly.

To determine which significant philosophical beliefs and concepts affect education most, it is better to take the question from backwards. Instead of listing all philosophical questions one by one, listing the main aims of education and finding what lies under them would be easier to grasp. It is not my aim to find all regarding philosophies of education, but to deal with the "concept of human" in this article. From Aristotle to Mevlana, the concept of human is discussed and asserted as a concept affecting a person's most ideas and behaviors. This concept is viewed as a pair of glasses one would never take off and see the world through it. It is regarded as the most significant and primary knowledge one could have by Rousseau, and it was the first task and question one needs to concern in Hellenistic society. As for education, the main instrument is "human" in education and the philosophy of human concept plays the 'determiner' role.

When gazed at curriculum circulations, one would notice the input and output of educational programs are determined as "persons". Similarly, schools start character or identity formation, humanization by the other name at early ages (Grieshaber & McArdle, 2014). The effect of education in human formation is so strong that nation-wide steps were taken in China to form one specific kind of people (Murray, 2012). Although it seems to be odd, Chinese history of education proves the strong relationship between human concept and education. As a Chinese philosopher, Confucius tried to establish the key concepts in human nature and Confucians now believe the importance of human nature in shaping moral education (Murray, 2012). Previously, Xunzi and Mencius in pre-historic times in China discussed human nature and they established ritual education accordingly (Lewis, 2003). They had different views of human nature, Xunzi believed the badness of human nature while Mencius believed the goodness of it. In this sense, their ritual education was different from each other.

In fact, the idea of human nature has been on the bottom line of education for a long time. Aristotle believed human beings are social animals and they have the gift of "curiosity", so he did not deliver information to his students but let them think and communicate to learn. The Christian doctrine believed human nature is bad and church curriculum was very strict on rules and behaviors. Islamic perspective took human nature as good and unique, so they had small classrooms and tutors.

However unfortunately, educational philosophy has been neglected with the introduction pragmatism. Learning techniques, classroom materials, timing issues and student success rates has been so important that the only real instrument and aim of the whole system has been forgotten: human. The Institute of Education (UK) quit Philosophy of Education as a faculty and tied it with Social Sciences. The faculty covered issues such as educational philosophy, freedom, and the conceptualization of person (Clark, 2013). However, unfortunately, the faculty is now a branch of social sciences, which leaves less time for the discussion and conceptualization of the "human issue". As a result, neither teacher candidates are given a chance at university to build a well-set philosophy nor we investigate their educational philosophies. It is outlined that educational philosophies should be stressed for better educational practices (Crookes, 2015) and there is a positive relationship between teacher candidate's educational philosophy and teaching/learning approaches (Sahan & Terzi, 2015; Hintz, 2014); however, studies to investigate teachers' educational philosophies deeply are very few. This does not seem to be a problem when looked from far, yet not knowing teachers' philosophy and not even questioning it means leaving teachers with a set of "go" and

"get" instructions without filling in their true meanings. In this study, teachers' philosophy as a complete issue is not discussed. Rather, their philosophies of human nature will be investigated.

In general perspectives as religion and preliminary philosophies, it is easier to notice the effect of human nature concept on educational practices. However, it seems harder to educators to anticipate the effect of their conceptions of human nature on singular classrooms. Although teacher and student personalities found similar to each other (Rausch, Karing, Dörfler & Artelt, 2016), the philosophy or conceptions that teachers have are mostly neglected for investigation. Instead, research of teacher effects on issues such as student competence (Mischo & Maaß, 2013), student satisfaction (Rashidi & Moghadam, 2014), language skills (Hassankiadeh, Jahandar & Khodabandehlou, 2012), and problem solving skills (Memnun, Akkaya & Haciomeroglu, 2012) have been more common in the field. It can be uttered that the direction towards searching observable notions is a side effect of positivism and pragmatism. However, human nature philosophy stays just in the center of education as a closed envelope. Knowing that human nature concept seems to be affecting educational practices from the bottom, the aim of this study is to investigate teachers' human nature philosophies in a pre-school in Istanbul, Turkey and inquire the effect of their human nature philosophies on their teaching practices. So, the research questions are as follows:

1. What is pre-school teachers' philosophy of human nature in terms of being good, free, equal and social?

2. How does teachers' philosophy of human nature affect their teaching practice?

As teacher philosophies and beliefs are not investigated deeply in the academic area, this study will be noteworthy in opening a new insight into the field. Additionally, human nature philosophy discussed mostly by researchers in the field of philosophy (Kaplama, 2016; Groll, 2015; Sugiyama, 2003), but educators left the topic untouched. Thus, the topic is discussed theoretically in general and the effect of human nature philosophy on educational practice remained unpacked. As a result, this study would contribute the field by filling in this gap.

1.1. Assumptions and Limitations of the Study:

In this study, it is assumed that teachers have their own philosophies of human nature and they will be open to reveal their philosophies. Also, it is assumed that teachers will be honest to the researcher through interviews and survey, and the outsider effect will be eliminated through observations. Assuming those, there will still be one limitation that the researcher will be able to learn about the philosophy of teachers as much as they reveal. Also, this study concerns the deep description of teachers' human nature philosophy and its effect on their teaching practices, not finding the true human nature concept and how it should be processed in classrooms. As a limitation of this study, it is recommended for further studies to take in hand.

## Methodology

### Research Design

This study is designed as a phenomenological research in qualitative research paradigm. As a grandchild of Edmund Husserl, phenomenological research aims to understand how people describe their experiences and how they believe of the meaning of these experiences (Patton, 2002, 107). As the aim of this study is to understand how pre-school teachers in a pre-school understand human nature and how their understanding reflect on their teaching practices, it was significant to use a method allowing deep inquiry. Also, as the main core of the study is human nature concept – or phenomenology as it could be uttered – phenomenological research was the best approach to direct the study.

**Participants**

Purposeful sampling is the type of sampling qualitative paradigm encourages researchers to use as it allows them to get unique (Maxwell, 1996, 70) and plentiful (Yin, 2011, 88) data. Being interested in human nature concept and working as a principal in a pre-school of one of the universities in Istanbul, Turkey, I had plenty of time observing teachers attitudes towards children and having conversations with them about most subjects. I know their lives, previous experiences, burdens and personalities. It was my idea that their personalities affected their classrooms and students, and I got curious about how they understand human nature in the first place as I was working on it. Being curious as a researcher about a certain group of people, I decided to ask them to be participants in my study and they responded positively. As all the teachers in the pre-school I was working in were female, the participants of the study consist of five female pre-school teachers. All participant teachers had students between 3 and 5 years old. Two other teachers, on the other hand, were interviewed as pilot.

**Data Collection Tools**

In the study, two different data collections were used: semi-structured interview form and semi-structured observation form. The researcher prepared the interview questions after reviewing literature about human nature and education and two experts in the areas of education and philosophy reviewed them. Also, two pilot interviews were done with two teachers in the pre-school and two questions were revised.

For the observation form, key issues to be observed were listed accordingly with the criteria used while preparing the interview questions. In qualitative research, taking field notes is a significant task and it is suggested to have key ideas or concepts to consider during observation (Berg, 2001). Thus, the key sentences were believed to be helpful for observation. The observation form was reviewed by two experts in the field of education this time and it was tested by two pilot observations.

**Validity and Reliability**

Validity and reliability of a research lies not only on the data collection tools and procedure, but also the design of the study. In this study, the reason to choose qualitative paradigm was that qualitative paradigm allows researchers to understand the meanings that individuals give to certain practices (Berg, 2001, 10). As the aim of this study was to understand how pre-school teachers understand human nature concept and how their understandings affect their teaching practices, qualitative paradigm seemed to be fitting. Also, as the core of the study is human nature concept and how individuals understand it, phenomenological research was selected to direct the study into understanding human conceptions about a shared experience (Patton, 2002, 104).

Among data collection tools, semi-structured interview was prepared based on literature to increase the validity, it will be controlled by at least two experts and a pilot interview was implemented to check the reliability and validity. Similarly, semi-structured observation form practiced as pilot notes to eliminate the effect of observer and improve the reliability and validity of the notes. For the internal validity of these qualitative data, the researcher did not manipulate the participants, data was recorded (tape recorder with the grant of participants for interview and note-taking for observation), the researcher took a role as participant throughout the study. As the researcher was already a part of the community in the pre-school, it was expected that teachers do not feel her as a stranger in their classrooms. But to eliminate the effect of a manager, the researcher explicitly explained her aim of the study and how she would use the data. Also, she ensured that every participant had access to the researcher and they had a word on the results by sharing them with the participants and taking their grant. For the external validity, methods and tools were

controlled by an expert, the researcher gave detailed information about the study and make the participants comfortable, and adjusted her relationship with the participants as equal to them.

For internal validity, the researcher tried to eliminate observer effect by spending much time with participants. By spending much time, maturation was expected to occur and internal validity would be increased, as the data would be more close to being constant. As the participants and data collection tools were selected purposefully, both internal and external validity were much improved.

**Data Collection**

Before data collection, the researcher will explain the aim and the process of the study will be explained to all participants and a protocol will be made between the researcher and the participants. Both qualitative and quantitative data of this study will be collected by the researcher herself. The interviews will be done face-to-face and be recorded into tape. For the observation, the researcher will attend teachers' classes and take field notes. As for the survey, the researcher will give the survey forms to the participants and make explanations when necessary.

**Data Analysis**

For the qualitative data, thematic analysis was implemented. The interviews were transcribed, coded, categorized and themes were found. The transcriptions of interviews and observation notes were given to two other peers and peer-check will be done. This way, internal reliability will be provided.

## Findings

**Teacher Conceptions About Human Nature**

The first research question of this study asks how pre-school teachers understand human nature. The researcher interviewed the participants to understand how they understand human nature, recorded the interviews, coded them and found themes. The results of the interviews could be found in Table 2.

**Table 2.** Themes of teacher conceptions of human nature.

| **Themes drawn from the interviews** | | | |
|---|---|---|---|
| **Frequency Rank** | **Theme** | Explanation | Quotation |
| **1** | **Environment** | The environment is effective in human formation. | *"Humans learn how to be social from the environment. They see other people and they interact with them" (T5)*<br>*"There are features that we have from birth, but environment is very effective. Human nature can change" (T2)*<br>*"Humans learn how to be equal in human relationships. When we are outside, we learn that we are equals." (T3)* |
| **2** | **Education** | Education shapes people. | *"Education affects people very well." (T3)*<br>*"After family, education affects the child. But for good education, teacher needs to be good, too." (T5)*<br>*"Education affects children. Most of them." (T2)* |
| **3** | **Mind** | Humans have minds, they are able to think. | *"Humans are superior to other species in terms of mind. They can think." (T5)*<br>*"First of all, humans can think. That is very special." (T1)*<br>*"When I think of humans, a wide definition comes to my mind. Humans can think, understand, talk." (T3)* |
| **4** | **Goodness** | Humans are good by their nature. | *"Indeed, humans are good. Babies are good. Their environment makes them bad. (T3)*<br>*"People are born as good. With the effect of environment, their nature* |

| | | | |
|---|---|---|---|
| | | | *changes." (T2)* |
| **5** | **Not equal** | People are not equals to each other. | *"Humans are not equal. From birth, even women and men are not equals to each other." (T2)*<br>*"Equality, socio-economic situation, body situation… They all affect. We are not equals." (T4)* |

Teachers expressed different viewpoints about human nature; however, they all agreed that humans can change. They believed the effect of environment was very influential on people: *"Humans are good by birth. But environment, human relationships change them." (T1).* Also, they believed education has a place in shaping people (see Table 2 row 3) and people have the ability to think (see Table 2 row 4). They also believed humans are good by their nature; however they believed they are not equals. In general, they had different understandings of human nature. Some believed human nature is like a blank page (*"People are neutral by their nature. They become what they see and experience." (T5))*, while another attributed a religious meaning to humans (*"We are what our God made us, we have small portion of command."* (T2)).

The fact that teachers had different understandings of human nature is not a handicap in terms of this study as the aim was not to drive a consensus out of their ideas but to understand how they concept this phenomenon. However, the conceptions of human nature were categorized as in Table 3.

**Table 3.** Categories of teacher conceptions on human nature

| | **Teacher 1** | **Teacher 2** | **Teacher 3** | **Teacher 4** | **Teacher 5** |
|---|---|---|---|---|---|
| **Goodness by nature** | + | + | + | - | - |
| **Freedom by nature** | + | - | - | - | - |
| **Equality by nature** | + | - | + | - | + |
| **Sociality by nature** | + | + | + | + | + |
| **Ability to learn** | + | + | + | + | + |
| **Religious attribution** | - | + | - | + | + |

### Teaching Practices and Conceptions of Human Nature

After interviewing teachers about human nature, their teaching practices were observed to understand how their conceptions affect their teaching. The findings are given in Table 4.

**Table 4.** Observations

| | **Classroom1** | **Classroom 2** | **Classroom 3** | **Classroom 4** | **Classroom5** |
|---|---|---|---|---|---|
| Believing students are good by their nature | *Teacher rewards students for their good behavior.* | *Teacher warns misbehaved students in a well manner.* | *Teacher rewards students for their good behavior.*<br>*Teacher warns misbehaved students in a well manner.* | *Teacher rewards students for their good behavior.*<br>*Teacher warns misbehaved students in a strict manner.* | *Teacher rewards students for their good behavior.* |
| Believing students are free by their nature | *Students have choices in the classroom.* | *Students have choices in the classroom.*<br>*Students are generally directed by teacher command.* | *Teacher is the authority in the classroom.*<br>*Students have few words over classroom activities.* | *Teacher wants students to do what she wants.*<br>*Students have few words over classroom activities.* | *Teacher gives choices to students.*<br>*Students have few words over classroom activities.* |
| Believing | *Students do not* | *Students do not* | *Students have* | *Male and female* | *Teacher treats* |

| | | | | | |
|---|---|---|---|---|---|
| students are equals by their nature | *have words equally in the classroom.* | *have words equally in the classroom.* | *words equally in the classroom.* | *students are treated differently in the classroom.* | *students equally.* |
| Believing students are social by their nature | *Students have time to interact with each other in the classroom.*<br>*Students can interact with teacher in the classroom.* | *Students have time to interact with each other in the classroom.* | *Students have time to interact with each other in the classroom.*<br>*Students can interact with teacher in the classroom.* | *Students have time to interact with teacher. Students have little time to interact with each other.* | *Students have time to interact with each other in the classroom.*<br>*Students can interact with teacher in the classroom.* |
| Believing students can learn | *Teacher gives chance to students to find correct answer.*<br>*Teacher encourages student participation.*<br>*Teacher believes students can be successful.* | *Teacher rewards students who give correct answers.*<br>*Teacher believes students can be successful.* | *Teacher gives chance to students to find correct answer.*<br>*Teacher warns students in a well manner.* | *Teacher rewards students who give correct answers.*<br>*Teacher warns misbehaved students in a strict manner.* | *Teacher rewards students who give correct answers.*<br>*Teacher believes students can be successful.* |
| Attributing religious terms into classroom | - | *Teacher refers to God while correcting students' behavior.* | - | - | - |

When classroom observations and teacher conceptions of human nature are compared, it could be seen that they are interrelated. Teachers mostly behaved in compliance with their philosophical beliefs of human nature. However, their behaviors did not always reflect the philosophical understandings. For example, teachers who believed the goodness in human nature (T1,2,3) used more reward in their classrooms. Although the natural goodness cannot be rewarded, they were observed to be similar in their rewards and smooth warnings. They were more smiling in the classroom, more tolerant and understanding. They were not easily tempered and had some room for mistakes. Yet, rewarding students for the goodness they already have in their nature is not a philosophical tendency. Teacher 1,2 and 3's behavior can be explained with their effort to keep children close to their natural tendency for good.

Teachers who believed equality by nature treated students equally and gave equal words to them. T4 treated students unequally although she stated that she believed that children are equal by their nature. She behaved closer, more understanding and more tolerant to certain students while heavily criticizing and strictly warning other certain students. Especially well-mannered, tidy, silent students were featured by T4 while active, kinesthetic and slow learner students were treated unequally.

As for sociality and the ability to learn, all teachers believed humans have those features by their nature and most of they let students interact with each other, become socialized people in the classroom. Also, they warned students' mistakes in a well manner and showed they believed students can learn. For religious attributions, on the other hand, only one teacher used religious attributions in the classroom. While correcting students behavior, T2 referred to the God and made explanations such as "God loves honesty", etc. although T4 and T5 stated religious attribution in the interviews, they were observed with no religious references in their classrooms just as the national curriculum suggests.

## Results and Discussion

The concept of human nature is very essential in philosophy (Machery, 2008). While it takes such a significant place in philosophy, it would be unreasonable if it did not have a place in educational philosophy. Indeed, prominent educational philosophers like Jean Jacques Rousseau, Immanuel Kant, John Dewey and many others identified human nature before they advised a certain way of education.

In this study, similarly, the understanding of teachers about human nature was investigated via interviews. It was found that they had different views of human nature; however, they agreed on the effect of environment, education and the ability to think. As the backgrounds of the participant were different, it is acceptable they have different understandings of human nature as background information is identified as effective in various personal beliefs (Zimmerman, Bandura & Martinez-Pons; Horne, Graupner, Frost, Weinman, Wright & Hankins, 2004; Ninio, 1988).

Also, the effect of teachers' human nature concepts was found effective on their teaching practices. It is a significant finding that teachers' beliefs of human nature affect their teaching practices as teacher beliefs have been found to be effective on many curriculum implementation (Cronin-Jones, 1991), technology implementation (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012), and cultures of teaching (Brousseau, Book & Byers, 1988). With this study, a new field has been opened for investigation. Although there were contradictions, the similarities are significant to consider. T4 warned students strictly although she believed humans have the ability to learn by their nature. Moreover, T4 and T5 did not use religious attributions in classroom although they believed it has a place in human nature. It is a limitation of this study that those teachers were not interviewed again to understand why those conflicts happened. Thus, it is recommended for further studies to investigate the reasons of any conflicts and parallelisms between teachers' human nature concept and teaching practices.

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# Rethinking Seamless Learning Through Metaverse: Meta Seamless Learning

*Research Article*

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ABSTRACT

Seamless learning focuses on sustaining learning experiences in various dimensions. Seamless learning comprises learning experiences including individual and social learning in virtual worlds as well as physical world in formal or informal education processes. This study aimed to examine seamless learning based on the phenomenon of metaverse. It is important to know what Metaverse means for seamless learning as a learning tool. Therefore, in this study, four randomly selected metaverse environments were examined based on the principles of seamless learning. This study tried to answer the questions of to what extent metaverse environments meet the ten principles of seamless learning, and whether these environments can be used as a seamless learning tool. The findings revealed that the randomly selected Second Life, Minecraft, Spatial.io and Roblox metaverse environments largely met the principles of seamless learning. In addition, the ten principles of seamless learning were reconsidered in the context of the metaverse. Since the sixth principle of seamless learning, the principle of covering physical and virtual worlds, is a fundamental feature of the metaverse, this criterion does not need to be sought in seamless learning studies using metaverse. Similarly, the seventh principle of seamless learning requires the use of multiple devices which is also a feature of metaverse environments. Thus this principle may be ignored in continuous learning studies using metaverse as well. As a result, the principles of seamless learning were revised in the context of metaverse and reduced to eight principles.



**Keywords:**

Metaverse, seamless learning, education.

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## Introduction

The concept of metaverse, a frequently mentioned technology recently, have attracted the attention of researchers. Metaverse, which has become more popular with the interaction it offers to users, is based on the interaction of technologies including virtual environments and objects that provide life-like experiences (Çukurbaşı Calisir et al., 2022). In the metaverse multi-user interaction world, learners can develop a sense of presence by providing high interaction among learners. Representing a new virtual universe, the term *metaverse* is derived from the combination of the words *meta* and *universe* (Zhang et al., 2022). It was introduced in the novel Snow Crash by the American novelist Neil Stephenson (Stephenson, 2003).

Continuity in education is essential. The concept of seamless learning, which allows the continuity of education, has been defined by several researchers. Seamless learning was introduced in the literature by Kuh (1996) who defined it as the continuity between formal and informal learning environments. Şad et al. (2016), on the other hand, defined it as learning that enables individuals to access to learning resources via mobile and wireless devices, without any time and place limitations, and combines students' formal learning experiences at school with their daily experiences outside of school without any interruption.

A number of tools are needed for seamless learning. It is expected that the tools used by the students to continue their learning in extracurricular times within the scope of seamless learning serve these purposes. Thus, seamless learning designs should be performed using appropriate tools. In this context, this study tried to examine metaverse environments' success in fulfilling seamless learning purposes.

There are a number of studies on seamless learning in the literature (Amhag, 2017; Bothe & Meinel, 2019; Chai et al., 2016; Hamid et al., 2019). However, there is a lack of studies on seamless learning and its principles in metaverse context. In this study, the principles of seamless learning were re-examined in the context of the metaverse.

- To what extent metaverse environments meet the principles of seamless learning?
- Are seamless learning principles suitable for the metaverse?

### Metaverse

With the advanced in the Internet, many new technologies have been introduced. One of these technologies is metaverse. The Metaverse refers to a post-reality universe, a continuous and persistent multi-user environment that combines physical reality with digital virtuality. Metaverse is based on the convergence of technologies, such as virtual worlds, digital objects, virtual reality, and augmented reality, that enable sensory interaction with humans. It consists of immersive environments linked to a social network on multi-user platforms (Mystakidis, 2022). The metaverse, in which a series of independent virtual worlds are assembled, has a number of features (Dionisio et al., 2013):

1- **Realism:** The virtual space offered by the metaverse allows users to feel psychologically and emotionally immersed in the real world.

2- **Ubiquity:** The metaverse should be accessible anywhere on mobile or desktop devices. In addition, virtual identities and features of the users should remain intact in the metaverse environment.

3- **Interoperability:** The metaverse is a combination of many independent sandboxes**.** In this sense, there should be common standards between virtual spaces. Allowing users immersive experiences, the metaverse provides seamless transition between locations without interruption.

4- **Scalable:** Metaverse environments must have physical support. The server architecture should allow a large number of users to co-exist in the metaverse environment.

Metaverse is a broad term that potentially include any digital thing in the future (Dahan et al., 2022). Although the concept of metaverse is not new, it has attracted attention since Facebook changed its name to

meta in October 2021. Metaverse is likely to be a system that will blend the real physical world and the digital world (Chinie et al., 2022). In order to fully understand the concept of metaverse, its properties must also be known as well as its definition. Therefore, studies addressing the properties of the metaverse should also be examined. In one of these studies, the main features of the metaverse were stated as follows (Castronova, 2001; Díaz, 2020)

**Interactivity:** It refers to the user's interaction with others or the metaverse environment. This indicates that it can have an impact on objects and mutually on the behavior of other users.

**Corporeity:** Users are represented by avatars in the Metaverse environment. Corporeity represents the user's limited presence of the avatar in a limited environment. These limitations are gradually removed with the inclusion of new servers and bandwidth for a high degree of immersion and interaction with its users.

**Persistence:** Although metaverse users leave the metaverse environment, their current developments and changes in the metaverse environment remain hidden. When they join the Metaverse environment at another time, users can see the latest version of the changes. In later stages, with the merger of metaverse and artificial intelligence, avatars can act on behalf of their users even if they are not in the metaverse.

The Second Life is one of major metaverse environments (Bilhao Gomes & Klein, 2013; Chen, 2016; Kanematsu et al., 2014). It offers users a variety of possibilities. It stands out with its various features in terms of clothes and movements and contains many details. In this environment, users can perform functions such as walking, running and flying with avatars representing themselves (Schlemmer & Trein, 2009).

Another metaverse environment is Minecraft (Rospigliosi, 2022; Sánchez-López et al., 2022; Sweeney, 2019). Minecraft, developed by Mojang Studios, is virtual environment that allows players to interact in a fully modifiable three-dimensional environment made up of blocks and other assets. The diversity the game offers provides innumerable possibilities, allowing players to choose the way they play (Minecraft Wiki – The Ultimate Resource for Minecraft, 2022). In terms of the metaverse, Minecraft provides the ability to navigate using avatars and interact with other characters. It is played by millions of people around the world.

Roblox (Roblox, 2022), another game played by many people around the world, is also as a metaverse environment (Han et al., 2021; Jagneaux, n.y.; Park & Kim, 2022; Rospigliosi, 2022). Roblox, where real-like activities are carried out, allows users to reconstruct their game environments. Players can represent themselves by configuring their avatars. It also has its own economy and users can create and sell virtual objects (Jagneaux, 2022). In addition, learning activities can be conducted with the Roblox Education version.

As a three-dimensional learning environment, Spatial.io promises to represent the user with an avatar (Sriworapong et al., 2022). As a metaverse environment, Spatial.io offers an interface where users can create their own avatars (Park & Kim, 2022; Riyadi, 2022; Sriworapong et al., 2022). Spatial.io has different environment designs and provides a qualified environment to experience the metaverse (Spatial.io, 2022).

**Seamless Learning**

Seamless learning refers to human learning beyond lecture and classroom environments. Seamless learning is also self-regulated learning through inspiring and open educational environments (Ebner et al., 2016). Learning should carry on seamlessly across the context (Wong & Looi, 2011). It refers to the process of seamlessly integrating learning experiences in several dimensions, including formal and informal learning, individual and social learning, and the physical world and cyberspace (Wong & Looi, 2011). The concept of seamless learning, supported by 1:1 settings meaning one mobile device per student, indicates learning anywhere and anytime. Seamless learners are not obliged to carry out their learning tasks outside the school. The aim of seamless learning is to provide activities that reinforce learning wherever and whenever the student needs (Wong & Looi, 2011).

The word seamless refers to the constant connection of things that were once thought to be separate (in-class-out-of-class / academic-non-academic). In a seamless learning environment, students are encouraged to exploit the learning resources available inside or outside the classroom. In addition, students are expected to use their experiences to make sense of the information they learned in the classroom environment (Kuh, 1996).

Wong & Looi (2011) set forth the following 10 criteria for a learning activity to be considered in the scope of seamless learning:

**(MSL1) Encompassing formal and informal learning**

Formal and non-formal learning have intertwined with the greater use of technology in education. Learning can be categorized as formal and informal, official and unofficial. Irrespective of these perspectives, technology should be used more effectively in both environments. Therefore, seamless learning should be used for all forms of learning.

**(MSL2) Encompassing personalized and social learning**

Lots of seamless learning activities include collaborative tasks, face-to-face strategies as well as peer assistance or online strategies, group discussions. Seamless learning should include individualized and social learning. Bridging personalized and social learning is essential for seamless learning. Hence, seamless learning should include individualized and social learning

**(MSL3) Across time and (MSL4) Across locations**

Seamless learning facilitates learning whenever and wherever students are curious and motivated to learn. In addition, one-time event designs that limit students to single and relatively small areas do not comply with the principle of across locations. This includes activities carried out only in physical classrooms or limited activities on primary school campuses. The important issue is that seamless learning designs should enable learning anywhere and at any time. The features of the tools may limit the researcher in this regard. This principle refers to the continuation of learning between indoor and outdoor environments.

**(MSL5) Ubiquitous knowledge Access**

The fifth and sixth principles of seamless learning can be considered together, however, they should be examined separately. Ubiquitous knowledge Access, a principle of seamless learning, refers to the use of the internet while learning takes place. The sixth principle of seamless learning focuses on the seamless learning experience or habit that covers the physical and digital worlds. In addition, Ubiquitous knowledge Access stresses context-sensitive learning. Access to ubiquitous internet information is required to ensure seamless learning.

**(MSL6) Encompassing physical and digital worlds**

Seamless learning requires combining the digital and physical worlds using data from sensors and other media components and presenting them in a format that can be used in the digital realm. In seamless learning, learning should be able to use both the virtual world and the physical world efficiently simultaneously.

**(MSL7) Combined use of multiple device types**

Seamless learning requires the use of different devices together. There exist models for the combined use of more than one device. Even though students access learning resources from different devices, an integrated environment should be provided. Even if the student changes location, there should be no interruption in learning services as a requirement of the seamless learning.

**(MSL8) Seamless switching between multiple learning tasks**

It refers to seamless and quick switching between multiple learning tasks. For example, using devices for switching between multiple learning tasks during field trips. In seamless learning designs, a number of individual and group inquiry tasks can be included in learning flows. Some designs aim to strike a balance between the two activities by limiting on-site activities to, for example, data collection and measurement, brainstorming or internet searching, note-taking and geotagging (i.e. pre-sensing), etc.

**(MSL9) Knowledge synthesis**

One of the aims of seamless learning is to provide students with the skills of synthesizing knowledge. Seamless transition between different learning contexts is expected from seamless learning. With seamless learning, students can obtain data and information in different fields and forms, record and organize information. At the knowledge synthesis stage, the stages of Remembering, Understanding, Abstraction, Applying, Analyzing, Evaluating, and Creating in Bloom's taxonomy are important. In addition, personalized learning contents can be used to facilitate the student's synthesis of knowledge based on previous learning.

**(MSL10) Encompassing multiple pedagogical or learning activity models**

Another principle of seamless learning is that it should allow switching between different learning models such as self-regulated learning, cooperative learning or activity learning. In seamless learning, more learning modes should be activated compared to traditional learning. In addition, since extremely complex learning flows lead to cognitive overload, learning should be designed accordingly.

**The Purpose of the Study**

This study was carried out to examine metaverse environments in the context of seamless learning principles. In addition, in the study, seamless learning principles were re-evaluated based on the metaverse.

**The Significance of the Study**

Seamless learning is used to maintain the learning as a whole in the classroom and outside the classroom. Hence, it is the subject of interest in the field of education. In addition, a number of different technologies can be used as a tool in seamless learning. One of these tools is the metaverse. In this study, metaverse environments were examined as a tool in seamless learning.

## Method

In the study, qualitative research method was used in order to examine to what extent the metaverse environments meet the principles of seamless learning. In qualitative studies, if direct observation is not possible, written and visual materials and documents on the research topic are included in the study (Yıldırım & Şimşek, 1999). In this study, the document analysis method was used (Şad et al., 2016). Through document analysis, the studied topic and visual and written data sources were examined.

**Data Collection Tool**

Document analysis method was used in the study. Document covers everything that is available before the study. The documents subject to the investigation can be official or personal (Creswell, 2012). In this context, websites used as metaverse environments were examined using document analysis method. The date of each metaverse environment was tried to obtain from its own website and other sources.

**Data Analysis**

Descriptive analysis was performed in data analysis. Two types of analysis are frequently used in qualitative studies: descriptive analysis and content analysis. Content analysis requires in-depth analysis of the data. Content analysis enables revealing themes and dimensions that were not obvious before. Descriptive

analysis, the other type of qualitative data analysis, is used when the conceptual structure of the study is clearly identified before (Yıldırım & Şimşek, 2021).

This study was based on the 10 principles of seamless learning proposed by Wong & Looi (2011). Based on this framework, data on the included metaverse environments were collected and examined.

**Validity and Reliability**

Validity in qualitative research requires an unbiased investigation of the phenomenon. In order to obtain a holistic perspective on the investigated phenomenon or event, methods that confirm the data (such as variation, member checking, peer debriefing) are used (Yıldırım & Şimşek, 2021). In this study, expert opinion was used to ensure validity. In addition, an in-depth explanation of process was provided in order to ensure internal validity.

Principally, although reliability contradicts the basic features of qualitative research, some measures can be taken to increase reliability in qualitative research. In general, these measures include providing the details of the strategies used by the qualitative researcher at various stages and thus enabling other researchers to use them (Yıldırım & Şimşek, 2021). Hence, in this study, data collection and analysis procedures were explained in detail.

## Findings

The findings on the research question, "to what extent metaverse environments meet the principles of seamless learning?", is presented below.

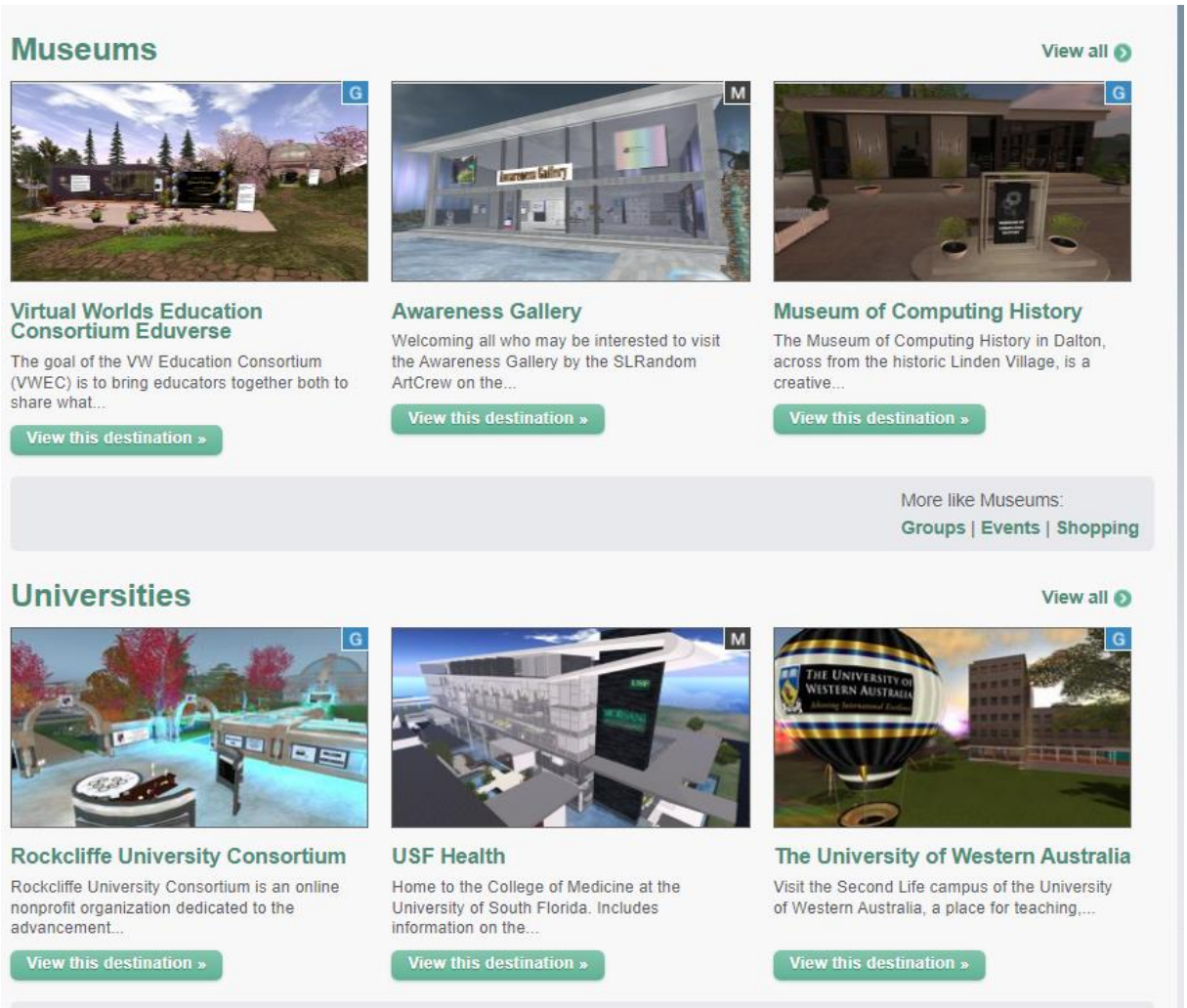


**Figure 1.** Second Life

There are a number of resources on the use of the Second Life in education. These include virtual campuses of several universities. In addition, there are environments used for museum-style learning purposes. Various meetings, virtual trainings and education can be held through the Second Life. Furthermore, users can build their own metaverse environments. The educational environments in Second Life are shown in Figure 1.

In this study, the Second Life was examined in the context of seamless learning. The first principle of seamless learning is that it encompasses formal and informal learning. Second Life has tools that can achieve formal learning purposes. Second Life offes virtual universities, virtual campuses and a number of educational environments. These features can be used for formal learning purposes. In addition, in order to achieve informal learning purposes, users can reveal their own learning experiences in the Second Life.

The second principle of seamless learning is that it encompasses personalized and social learning. Students can reach their individual learning goals through Second Life. In addition, Second Life allows students to interact with each other. Accordingly, Second Life meets the second principle of seamless learning. In terms of the third and fourth principles of seamless learning, the Second Life can only enhance one-way learning activities conducted in the classroom environment. Different learning environments can be used for different learning purposes in the Second Life. In addition, it is possible for students to access the Second Life whenever and wherever they want. However, the fact that there is no official mobile application for Second Life and that users need to use secondary resources for mobile access limit students. The fifth principle in seamless learning is Ubiquitous knowledge Access which mostly refers to the involvement of the internet in students' access to information. An internet connection is required to access the Second Life environment and offline access is limited. Therefore, it is not possible to access in cases where there is no internet connection. The sixth principle of seamless learning refers to the simultaneous use of the physical and virtual world. An appropriate course design enables students to experience the physical and virtual worlds simultaneously in the Second Life.

The examination of Second Life based on the the seventh principle of seamless learning, that is **combined use of multiple device types**, reveals some limitations. This principle requires students to continue learning from different devices seamlessly. Although Second Life does not have an official mobile application, limited access can be provided through some secondary applications. Therefore, Second Life does not fully meet this principle. Seamless switching between multiple learning tasks is the eighth principle of seamless learning. Considering this principle, it can be said that Second Life provides transition between different learning tasks. For example, after taking the anatomy course at school, students can examine anatomical models at home in the Second Life.

Second Life meets the ninth principle of seamless learning that is synthesizing knowledge. Components in Second Life improve students' ability to synthesize information as well as acquire information. In particular, using three-dimensional models facilitates students' ability to synthesize information. **Encompassing multiple pedagogical or learning activity models**, the tenth principle of the seamless learning, is possible with the ability of the users to design the environment in Second Life. Different activities may be needed during learning. Students may need to carry out collaborative tasks. Second Life can also support different learning models with the opportunities it offers.

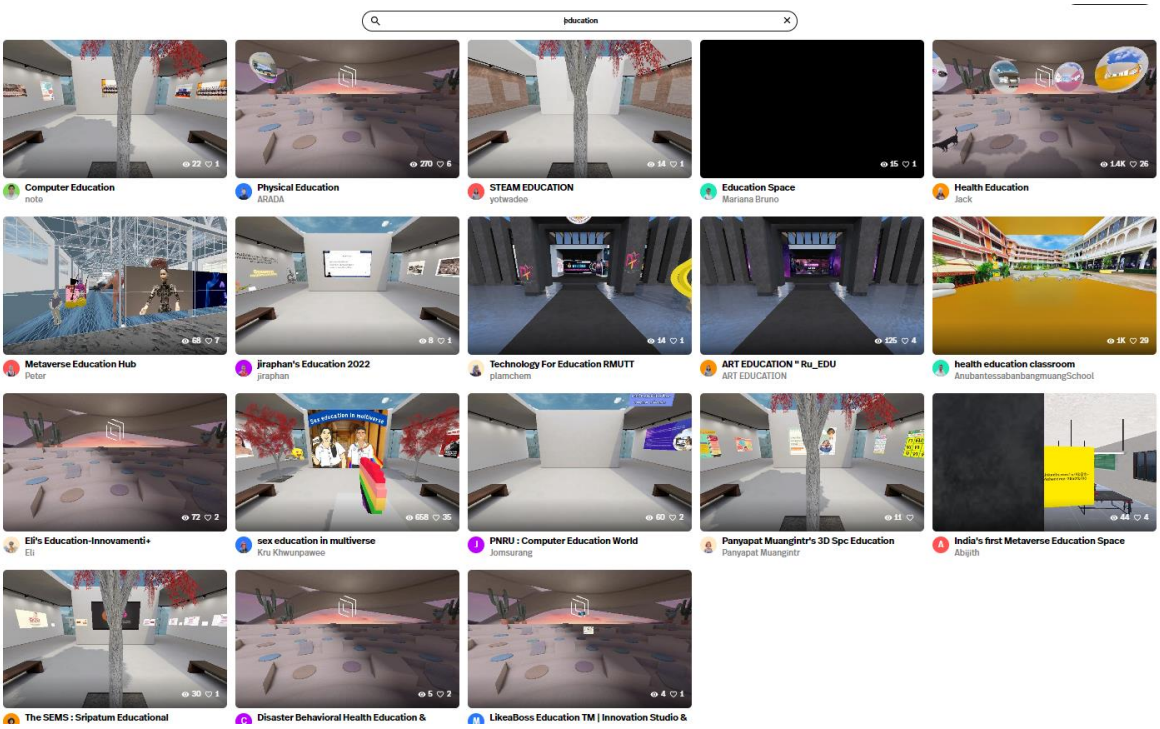


**Figure 2.** Spatial.io

Another metaverse environment used for educational purposes is the spatial.io. Students can experience the metaverse with this environment. In addition, it can be improved using three-dimensional models, allowing students to have a better virtual experience. The examination of the Spatial.io environment revealed that there are various educational environments. While some environments are museum-like, some environments are enriched with three-dimensional objects. Spatial.io stands out for these features and its easy access from the web without the need for installation. Some learning environments established in the Spatial.io environment are presented in Figure 2. In this study, the spatial.io was examined based on the ten principles of seamless learning.

The spatial.io metaverse environment satisfies the first principle of seamless learning, that is encompasssing formal and informal learning. Students can use this environment during formal education and also can access it outside the school. In addition, teachers can use this environment for some learning activities outside the school. The second principle of seamless learning is that it encompasses individual and social learning. Spatial.io supports social learning with its structure that allows users to interact with each other. In addition, users can use it for individual learning purposes. In order to enrich the environment, it provides a structure allowing the contents to be exhibited as a gallery as well as its own three-dimensional objects. The third and fourth principles of seamless learning mean that students have access to information wherever and whenever they want. Spatial.io covers these principles since the it has a mobile application and computer interface. In addition, users can use augmented reality glasses if they have one.

The fifth principle of seamless learning requires a valid internet connection to access information. In addition, such environments need to have features that do not require an internet connection. However, the spatial.io is not an internet-independent environment. Hence, it does not meet the fifth principle of seamless learning. The sixth principle refers to the simultaneous use of the digital and physical worlds. The Spatial.io offers augmented reality through its mobile application and allows students to feel completely immersed by using augmented reality glasses. These aspects meet the sixth principle of seamless learning.

The seventh principle of seamless learning refers to the combined use of different devices. Spatial.io can be accessed through mobile devices, computer and augmented reality glasses. It is possible to log in from different devices with the same account. Therefore, it can be said that the seventh principle is satisfied.

The eighth principle of seamless learning refers to seamless switching between multitasking. Spatial.io enables switching between different learning tasks. Thus, it meets the eighth principle. The ninth principle of seamless learning is acquiring the skills to synthesize knowledge. Students can produce new knowledge and gain knowledge synthesis skills through 3D models in the spatial.io. Based on this perspective, it meets the ninth principle of seamless learning. The tenth principle of seamless learning is that the environment allows for various learning models such as self-directed and cooperative learning. In the Spatial.io, users can make use of ready-made 3D objects or with 3D models created by the users in accordance with the desired learning model. Thus, it meets the tenth principle.


**Figure 3.** Minecraft

Minecraft, another metaverse environment, can be used for learning purposes on education.minecraft.net. Minecraft offers learning opportunities on topics such as science, mathematics, computer science, language arts, history and culture, art and design, digital citizenship, social and emotional, equality and participation, climate and sustainability. Students can achieve their educational goals through Minecraft under the supervision of instructors. Minecraft learning contents are shown in Figure 3.

In the context of seamless learning, Minecraft meets the first principle of seamless learning, which is encompasssing formal and informal learning. Students can use the Minecraft metaverse environment both in and out the classroom. Minecraft meets the second principle of seamless learning, encompassing individual and social learning. In Minecraft, students can both work individually and have social learning opportunities. They can perform cooperative learning tasks using a virtual classroom environment. The third and fourth principles of seamless learning indicate access anywhere at any time. Minecraft can be accessed from a computer as well as from mobile devices. Therefore, students can access it whenever and wherever for educational purposes. The fifth principle refers to the use of the internet to access information. Contrary to

other metaverse environments, Minecraft can also be accessed offline. Therefore, it can be used as an educational environment even if there is no internet connection. Based on the sixth principle of seamless learning, Minecraft covers physical and virtual worlds. In addition, virtual and physical environments can be combined with augmented reality experience using Minecraft AR mode.

The seventh principle requires students to access the environment from different devices. Minecraft meets this principle as it offers access on different device types. Multitasking is under the eighth principle of seamless learning. In seamless learning, students are required to carry out multitasks seamlessly and rapidly. Minecraft allows for rapid multitasking in and out of the classroom. The ninth principle of seamless learning is synthesizing knowledge. Minecraft basically allows the user to make their own designs using blocks. Therefore, Minecraft allows the student to discover new knowledge. Therefore, it meets this principle. Based on the tenth principle of seamless learning, Minecraft supports more than one pedagogical model.

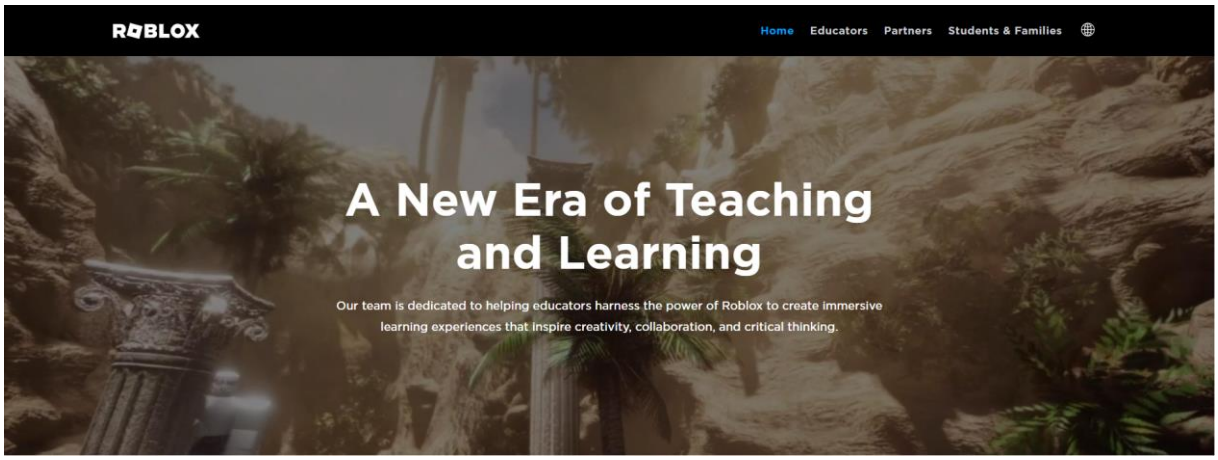


**Figure 4.** Roblox

As a metaverse environment, Roblox allows users to design their own games. Roblox can also be used for educational purposes with its education version. Users can create their own avatars and interact with other users. In addition, users can benefit from the Roblox to achieve their learning goals. Figure 4 shows an image of Roblox education environment.

In terms of formal and informal learning, the first principle of seamless learning, students can make use of Roblox for both formal and informal purposes. It can be used for both formal education and individual independent learning. The second principle of seamless learning is that it encompasses individual and social learning. Accordingly, in Roblox, students can colloborate with other students. In addition, students can implement their own designs and meet their individual learning needs. The third and fourth principles of seamless learning indicate that the student performs learning activities in the metaverse environment whenever and wherever. Since Roblox can be accessed from both computers and mobile devices, users can use it whenever and wherever they want. The fifth principle of seamless learning refers to the use of internet in accessing information. In this sense, Roblox cannot be used without internet access. Roblox covers the physical and virtual worlds. In addition, since Roblox is supported by augmented reality, physical and virtual worlds can be.

In terms of seventh seamless learning, Roblox provides access over more than one device. The It can be accessed both through the mobile application and the internet interface. The eighth principle of seamless learning is to switch between multiple learning tasks. The teacher can create learning goals that students can achieve on Roblox following the learning activities in the lesson. Thus, multiple learning tasks can be performed in Roblox. The ninth principle of seamless learning refers to the acquisition of knowledge synthesis skills. Roblox allows students to produce their own designs and also create their own games. Students' ability

to synthesize information can be supported by assigning appropriate tasks. In terms of the tenth principle of seamless learning, Roblox can be designed and used in line with different learning models.

The findings on the other research question "Are seamless learning principles suitable for the metaverse?" are as follows:

The first principle of seamless learning is that it encompasses formal and informal learning. Metaverse environments can be evaluated in terms of the first principle of seamless learning since they function formal and informal learning purposes.

The second principle of seamless learning is that it encompasses individual and social learning. Metaverse offers a social learning environment for users. In addition, metaverse environments can be used for individual purposes. This principle of seamless learning can be evaluated for the metaverse.

The third and fourth principles of seamless learning are relared to enabling students to learn whenever and wherever they want. It can be examined whether this principle is taken into account in metaverse.

The fifth principle of seamless learning refers to using the internet to access information. Internet is essential for accessing the Metaverse. An internet connection is required for a social learning environment. In the context of the metaverse, this principle of seamless learning needs attention.

The sixth principle of seamless learning is that it covers the physical and digital worlds. In this sense, it is necessary to know the definition of the metaverse. The metaverse is basically the post-reality universe, which is a continuous and persistent multi-user environment that combines physical reality with digital virtuality (Dionisio et al., 2013). Based on this definition, there is no need to examine whether metaverse meets the sixth principle in seamless learning activities as a virtual environment is required to meet this principle to be considered a metaverse.

The seventh principle of seamless learning is to be able to access it from multiple devices. Due to the ubiquity of the metaverse (Wong & Looi, 2011; Dionisio et al., 2013), it requires users to be accessible from different devices such as mobile and desktop. Hence, there is no need to examine the seventh principle of seamless learning in a learning activity in which metaverse environments are used since access from different devices is required to qualify an environment as a metaverse.

The eighth principle of seamless learning involves switching between multiple learning tasks. The metaverse can be used in this context, and meets this principle. The ninth principle of seamless learning is the synthesis of knowledge. In this sense, metaverse environments have these possibilities, but this principle is needed to distinguish metaverse environment designs from each other. The tenth principle of seamless learning is that it covers more than one pedagogical model or learning model. This principle should be used to understand whether the designs of metaverse environments include learning models or pedagogical models.

## Conclusions

In this study, metaverse environments were examined in terms of seamless learning. The findings revealed that metaverse environments do not fully meet the principles of seamless learning, but to a large extent. The study also indicated that there are some prominent aspects of metaverse environments.

It was found that all metaverse environments meet the first principle of seamless learning. All metaverse environments have the potential to enable learning inside and outside the classroom. In addition, they also offer individual use for informal purposes.

The second principle of seamless learning is that it encompasses individual and social learning. The metaverse environments examined in this study can serve both the individual learning purposes and the social learning purposes in which many users interact with each other.

Considering the third and fourth principles of seamless learning, metaverse environments should provide access whenever and wherever desired. All metaverse environments offer access from both mobile devices and computers. In this sense, they meet the third and fourth principles of seamless learning.

The fifth principle of seamless learning is about access to information. Unlike the third and fourth principles, the fifth principle requires a valid internet connection. An internet connection is required to access Metaverse environments. One exception is that the Minecraft also offers offline opportunities.

The sixth principle of seamless learning involves using the physical and virtual worlds simultaneously. This principle is satisfied by the nature of the metaverse. The metaverse refers to environments designed to offer lifelike experiences. Therefore, metaverse environments fully meet the sixth principle.

The seventh principle of seamless learning requires access to the metaverse environment from different devices. In this sense, all four environments offer access via computer. Users can also access them both from computer, mobile devices and other devices such as augmented reality glasses.

The eighth principle of seamless learning involves switching between multiple tasks. All four environments offer synchronized switching between multitasks. In addition, since they can be accessed through an account, it is possible for students to have individualized learning environments.

In terms of the ninth principle of seamless learning, metaverse environments provide opportunities to synthesize knowledge sice students have the tools to produce knowledge in all of these environments. Offering rich possibilities for generating new knowledge, they fully meet this principle.

Considering the tenth principle of seamless learning, it can be seen that there are approaches based on different pedagogical models in metaverse environments. In addition, there are mostly studies on exploratory learning or cooperative learning in metaverse environments. Several teaching models or pedagogical models can be used easily in metaverse environments.

In addition, considering the principles of seamless learning in terms of the metaverse, some principles may not be needed. Taking into account the characteristics of the metaverse, the ten principles of seamless learning proposed by Wong & Looi, (2011) have been revised as meta-seamless learning principles:

(MSL1) Encompassing formal and informal learning

(MSL2) Encompassing personalized and social learning

(MSL3) Across time

(MSL4) Across locations

(MSL5) Ubiquitous knowledge Access

(MSL6) Seamless switching between multiple learning tasks

(MSL7) Knowledge synthesis

(MSL8) Encompassing multiple pedagogical or learning activity models

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# Pre-Service Social Studies Teachers' Cognitive Structures on Human Rights and Democracy

*Research Article*

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ABSTRACT

The aim of this study was to examine the cognitive structures of pre-service social studies teachers regarding the concepts of human rights and democracy. For this purpose, a word association test was applied. In the test, the participants were asked to express their views on human rights and democracy concepts. A total of 94 pre-service teachers participated in the study based on voluntary participation and criterion sampling. The study was conducted during the spring semester of the 2019-2020 academic year, while the COVID-19 pandemic was ongoing. To reach the participants, the university's remote learning platform was used, and word association tests were administered. The data were analyzed by two researchers. It was found that the participants produced 69 sentences containing scientific knowledge related to the concept of democracy and 73 sentences related to the concept of human rights. Furthermore, it was observed that the participants placed a strong emphasis on the words "equality" and "freedom" in relation to both human rights and democracy. It was also determined that the participants generated more sentences with conceptual misconceptions regarding the concept of democracy.



**Keywords:**
Human rights, democracy, word association test, cognitive structure, pre-service social studies teachers.

## Introduction

Thinking is one of the most complex activities of the human mind. It involves processes such as generating ideas, analyzing and synthesizing information, reaching conclusions, and other similar activities. These abilities are considered crucial for the human mind to perceive the external world and to internalize information in order to ensure its continuity in the given environment. When perceiving and interpreting the

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external world, human beings rely on concepts and cognitive structures in which they can place these concepts. The term *concept* refers to the abstract and generalized representation of an object or thought in the mind (TDK, 2023). In other words, a concept is a symbol given to a group of objects or events that share specific characteristics (Balbağ, 2018). People recognize, distinguish, select, and combine through concepts; thus, concepts are the fundamental mental formations that individuals rely on to navigate their lives (Bozkurt, 2018).

Cognitive structures, in which concepts are embedded and shaped, are as important as the concepts themselves mainly due to the fact that cognitive structures enable the abstract designs in the mind to manifest, become usable, and functionalize those designs. Ekici, Gökmen and Kurt (2014) emphasize that conceptual knowledge exceeds merely recognizing a concept or knowing its definition and name; it also involves being able to perceive transitions and relationships between concepts. Therefore, the teaching of concepts is an activity that requires particular attention; otherwise, the occurrence of conceptual misunderstandings is a potential consequence (Balbağ, 2018). In this sense, shaping learners' cognitive structures during the process of concept instruction will not only reduce conceptual misconceptions but also give greater significance to the formation of transitions and relationships between concepts.

Structure is described as a collection of distinguishable elements and the relationships between these elements. It can also be objective and real or subjective and internal (Shavelson, 1972, cited in Shavelson & Stanton, 1975). Cognitive structures, on the other hand, are the structures that reveal the relationships between concepts stored in long-term memory (Özcan & Tavukçuoğlu, 2018). Cognitive structures, also referred to as "mental structures", "cognitive tools" or "thought patterns" are the essential mental processes individuals employ to comprehend and make sense of information (Garner, 2007). The essence of cognitive structures lies in the mental processes engaged in information processing, comprehension, and meaning creation (Basir, Waluya, Dwijanto & Isnarto, 2022). During the formation of these structures, learners establish "cognitive bridges" between their existing knowledge and new information. As it is known, learning a concept goes beyond just learning its name or definition. Learning a concept also means establishing relationships between the concept and the whole (Özcan & Tavukçuoğlu, 2018). Indeed, cognitive structures play a significant role in learners' information processing skills and provide a reference framework for the mind that is working to study or comprehend one or more aspects of a concept (Navaneedhan & Kamalanabhan, 2017). Therefore, it can be stated that cognitive structures are fundamental psychological systems related to gathering, organizing, and processing information (Garner, 2007).

Koltko-Rivera (2007) emphasizes that cognitive structures should be interpreted as the creation and utilization of abstract mental representations. Aligned with the notions mentioned above, it should be acknowledged that cognitive structures play an undeniable role in an individual's learning and adaptation to a changing world. When individuals use their cognitive structures, they employ metability, which refers to the ability to transform or change. Metability encompasses the concept of "meta" from metamorphosis, meaning "change/transformation" and the continuity implied by the term "ability." It involves a dynamic, interactive, creative, and transformative cycle that is intrinsic to the process of learning. Learning exceeds the mere accumulation and integration of facts and skills. It encompasses an ongoing process of creation and modification, constantly evolving alongside the learner. In a rapidly changing world, it is unrealistic to expect that individuals' learning remains stagnant amidst the constant influx of multimedia content. When learners comprehend what and how they need to learn and solve, they gain the ability to make sense of unfamiliar information encountered in their daily lives. The cultivation of cognitive structures and metability empowers learners to adapt more readily and swiftly to the ever-evolving world, thereby enhancing their understanding and comprehension of abstract concepts (Garner, 2007).

As noted by Koltko-Rivera (2007), the concept of cognitive structure encompasses a range of different ideas. The term cognitive structure is employed to describe knowledge and mental mapping, to highlight

personal variations in cognitive processes and mechanisms rather than the concept of schema, and to represent the meaning and conceptual framework associated with a text. Within this framework, individuals utilize their cognitive structures to process information by *establishing connections*, *identifying patterns*, *formulating rules*, and *summarizing principles* (Garner, 2007).

During the process of learning, individuals engage in making connections, identifying patterns, and formulating rules and principles, which guide their thinking. According to Ausubel (1963), explicit, stable, and well-organized cognitive structures facilitate the ease of learning and retention of subject matter. On the other hand, if they are unstable, disorganized, uncertain, or chaotic, learning and retention are hindered. Therefore, it should be noted that guided cognitive structures can have a positive impact on meaningful learning and retention, facilitating the easier acquisition and retention of new knowledge. According to Garner (2007), learners develop cognitive structures through *reflective awareness* and *visualization*. As learners gain reflective awareness of the information conveyed by their senses and mentally visualize this information, their cognitive structures strengthen, enhancing their learning and creative abilities. Reflective awareness and visualization are considered instrumental in the development and reinforcement of cognitive structures. Garner (2007) summarizes the relationships between reflective awareness, visualization, and cognitive structures as shown in Figure 1.

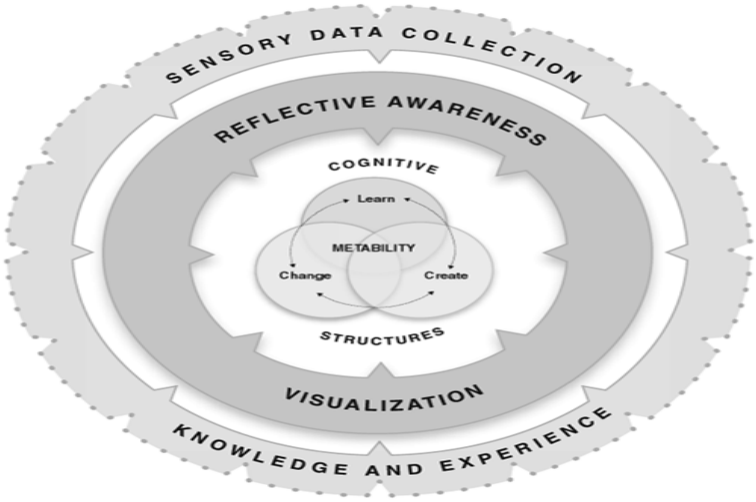


**Figure 1.** The interaction of reflective awareness, visualization, cognitive structures and metability (Garner, 2007)

*Reflective awareness* is conscious perception. Reflection is the evaluation through thought wheread awareness is the state of being attentive. Being conscious means directing one's focus inward towards oneself as a thinking and feeling individual, being attentive to one's thoughts, emotions, and experiences. Perception, on the other hand, is assigning meaning to something, mentally grasping or consciously understanding it. To attain reflective awareness, individuals need to attentively perceive and anticipate the stimuli they encounter through their senses, encompassing visual, auditory, tactile, gustatory, and olfactory sensations. Visualization, conversely, entails mentally representing and manipulating knowledge, ideas, emotions, and sensory experiences. As individuals cultivate reflective awareness of the messages or stimuli transmitted by their senses, it becomes vital for them to possess the capacity to envision and proficiently process this information in order to optimize their cognitive processing (Garner, 2007).

In order to facilitate the processes of reflective awareness and visualization, educators have important roles in learning and teaching environments. Navaneedhan and Kamalanabhan (2017) define cognitive structures as mental schemas, and emphasize the importance of information processing for teachers to facilitate an effective instructional process. This can be achieved by carefully planning and implementing lessons that promote metaphorical thinking, thus enhancing the effectiveness of the teaching-learning process. In learning and teaching contexts, it is advantageous for educators to perform cognitive structure analysis of

learners since cognitive structures are believed to significantly influence the learning process of individuals. In this context, cognitive structures can be analyzed using various techniques including multiple-choice tests, concept mapping, analogies, and word association tests (Yilmaz, 2019). Shavelson (1974) states that different methods can be used to reveal cognitive structures related to individuals, such as card sorting, graphing, and word association. Similarly, Yayla and Ergün (2020) emphasize that word association tests are commonly preferred methods for identifying cognitive structures. Word association, originally introduced by Carl Jung, is a technique employed to reveal the personal complex structures residing in the subconscious mind of individuals. Jung argues that emotions, thoughts, and memories cluster around a central theme in individuals' minds in an organized manner. Word association tests are believed to reveal these organized states through associations (Shultz & Schultz, 2000, as cited in Spiteri, 2014). It is accepted that these tests uncover the connections and relationships between concepts within cognitive structures based on the sequential responses individuals provide to the given stimuli (Bahar & Özatlı, 2003). Structure refers to the arrangement of identifiable elements, while cognitive structure refers to the organization of concepts retained in an individual's memory (Shavelson, 1974). Cognitive structure is therefore delineated as a theoretical framework that pertains to the arrangement and organization of concepts within the long-term memory (Shavelson & Stanton, 1975). Accordingly, the function of word association tests is to elicit associations and patterns of what individuals retain in their memory regarding concepts.

Concepts, known as the mental building blocks that assist individuals in their daily lives, enable them to understand the external world, make distinctions, make choices among alternatives, and process information. Elements such as schemas and semantic networks, which are important in the processing and storage of information, serve as components of these concepts. Every educational activity within the context of knowledge structuring updates and reconstructs learners' concepts, schemas, and semantic networks, thereby providing opportunities for their development (Bozkurt, 2018). It is widely recognized that abstract concepts can be challenging to comprehend (Düşkün & Ünal, 2015). Therefore, it can be argued that the abstract nature of what is learned can have a negative impact on the formation of cognitive structures.

The inability to form a cognitive structure related to a concept is explained by the individual's inability to mentally associate the conceptual framework with the subject (Ekici, Gökmen & Kurt, 2014). In this context, the present study aims to uncover pre-service social studies teachers ’cognitive structures regarding the concepts of human rights and democracy. Given the abstract nature of these concepts, this study investigated the relationship network that pre-service teachers established.

According to Sartori (n.d), democracy refers to the power of the people, in other words, power resides in the hands of the people. However, Sartori further emphasizes that the definitions of the concept of democracy, both in its current state and aspired form, can vary significantly. This highlights the notion that democracy can occupy diverse positions within individuals' minds and worldviews. Similarly, as stated by Dahl (2021), the concept of democracy is marked by the endeavor to offer multiple definitions. It fundamentally encompasses five key criteria, which include the active participation of individuals, equal voting rights, access to information, the ability to influence the agenda, and the inclusion of adult citizens. Another concept that deserves attention in this context is human rights. Human rights can be defined as the comprehensive set of entitlements that individuals possess from birth, essential for their existence, dignity, and the establishment of favorable living conditions as human beings. In contemporary democratic nations, the primary purpose of the state is often perceived as safeguarding and actualizing human rights (Turhan, 2013). Human rights is a concept used to denote the desired ideal state rather than an acquired right or an achieved condition. This concept is attributed to individuals simply because they are human beings and encompasses the rights that individuals should possess (Yavuz, Duman & Karakaya, 2016). Research conducted on concepts can reveal individuals' cognitive structures related to those concepts. Conceptual

knowledge about a concept does not only involve recognizing or knowing its definition, but also expressing the relationships between concepts (Ekici & Kurt, 2014). Therefore, the aim of this study was to examine the level of familiarity among pre-service social studies teachers, as part of their teacher training programs, regarding the concepts of democracy and human rights. Additionally, the study aimed to determine their ability to establish connections between these two crucial concepts frequently encountered in their coursework, and to what extent they could generate associations between them.

## Methodology

### The Research Design

This study, with the objective of revealing the cognitive frameworks of pre-service social studies teachers concerning the concepts of human rights and democracy, employed a descriptive survey methodology. The survey methodology endeavors to portray the current state of affairs in an objective manner, without any deliberate intervention or manipulation of the phenomenon being examined, be it an individual or an object, under its natural circumstances (Karasar, 2004).

### Participants

The study group consisted of 94 pre-service teachers enrolled in the 3rd and 4th years of the Turkish Language and Social Sciences Education Department, specifically in the Social Studies Education Division, at a university situated in the Eastern Anatolia Region of Turkey. The study was conducted during the spring semester of the 2019-2020 academic year.

**Table 1.** Demographics of the Participants

| **Gender** | **f** | **%** |
|---|---|---|
| Male | 29 | 30.9 |
| Female | 65 | 69.1 |
| **Grade** | **f** | **%** |
| 3.Grade | 42 | 44.68 |
| 4.Grade | 52 | 55.32 |
| **Total** | 94 | 100 |

Table 1 reveals that the study involved 29 male and 65 female participants, with 42 participants in their 3rd year and 52 participants in their 4th year of study. The study employed the criterion sampling method, which involves the selection of observation units based on specific characteristics or circumstances. In criterion sampling, units that satisfy the predetermined criteria are included in the sample (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz & Demirel, 2019). In this study, the selection of the study group was based on the following criteria: the participants had to be 3rd or 4th year students in the Faculty of Education, Department of Social Studies Education at the university where the study was conducted, they had to have taken the course on Human Rights and Democracy Education, and achieved a passing grade in that course. Furthermore, the participation in the study was based on voluntary basis.

### Data Collection Tool

In this study, the word association test was employed as the instrument for data collection, aiming to unveil the cognitive frameworks of the participants concerning the designated concepts. It is one of the fundamental methods used to uncover cognitive structures (Shavelson, 1974; Yilmaz, 2019; Yayla & Ergün, 2020). In this test, participants are instructed to list the concepts evoked in their minds in connection to a given concept within a predetermined timeframe. It is suggested that the successive responses offered by the participants unveil the interrelationships between the concepts within their cognitive frameworks (Bahar & Özatlı, 2003). In the study, the word association test was designed using the concepts of human rights and democracy. Each concept was prepared on a separate page. Below is an example page layout.

Human rights……..

Human rights ……..

Human rights ……..

**Related Sentence……**

Democracy…….

Democracy …….

Democracy …….

Democracy …….

**Related Sentence ……**

In addition to word generation, the participants were also tasked with composing a sentence that pertains to the concepts of human rights and democracy.

**Data Collection**

The study was conducted amid the COVID-19 pandemic. Hence, the data collection process involved uploading the word association test onto the university's distance learning platform. This took place during the spring semester of the 2019-2020 academic year when the transition to distance education occurred. The test was uploaded in two separate pages, and a description of the word association test was provided, indicating the required time for each concept. Based on previous studies, a duration of 30 seconds was considered sufficient for each concept (Bahar, Johnstone & Sutcliffe, 1999; Çardak, 2009).

**The Data Analysis**

To analyze the word association test, frequency tables were generated to illustrate the occurrence rate of words regarding human rights and democracy conxpets. Based on these, concept maps were generated. The cut-off technique, introduced by Bahar, Alex, Johnstone, and Sutcliffe (1999), was used to generate the concept maps. This technique encompasses setting a specific cut-off below the most frequently cited word for each concept in the word association test. Responses surpassing this cut-off point are included in the initial section of the concept map. The cut-off point is moved downwards at specific intervals (Bahar&Özatlı, 2003). In this study, concept maps were generated based on the cut-off points of 70 and above, 69-50, 49-30, and 29-10. The concept maps were color-coded, using blue to represent the cut-off point of 70 and above, green for the range of 69-50, orange for 49-30, and purple for the cut-off point of 29-10.

A comprehensive analysis was undertaken to classify the sentences associated with the concepts of human rights and democracy in the word association test. The sentences were analyzed based on the categories put forward by Ercan, Taşdere, and Ercan (2010), Işıklı, Taşdere and Göz (2011) and Çelikkaya and Kürümlüoğlu (2019), which include *scientific knowledge-containing sentences*, *non-scientificandsuperficial knowledge-containing sentences*, and *sentences containing conceptual misconceptions*. The quotations extracted from the sentences written by pre-service teachers were coded using the follow sing labels: "FP" for female participants, "MP" for male participants, "G3" for 3rd-grade participants, and "G4" for 4th-grade participants. Data analysis was conducted collaboratively by two researchers. The obtained data were initially analyzed by one researcher and then by the other researcher. Two sentences did not reach a consensus. Subsequently, with the mutual agreement of the two researchers, it was decided to categorize these two sentences differently.

**Ethics Committee Decision**

This study was conducted with the approval of the Ethics Committee for Social and Human Sciences Research at Firat University (22/05/2020-97132852).

## Findings

This section presents the generated concept maps based on the cutoff points and the categories created for the concepts and related sentences. Four concept maps were created by considering the cutoff points. The concept map generated for the cutoff point of 70 and above is shown in Figure 2.

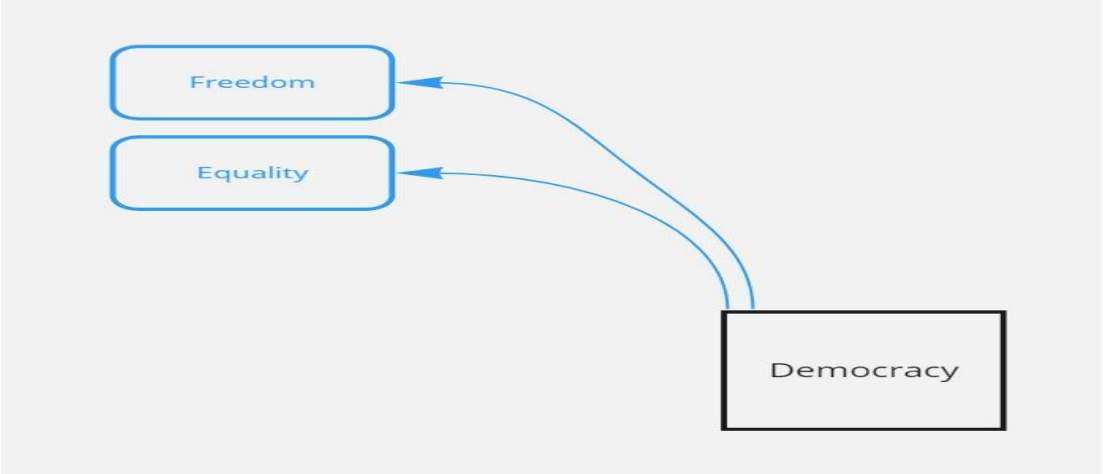


**Figure 2.** Concept map for the cutoff point of 70 and above

The concept map presented in Figure 2 for the cutoff point of 70 and above revealed that the participants only generated words related to democracy. The words associated with democracy were equality and freedom. Since no words were produced for human rights, it was not included in the concept map.

The concept map generated for the cutoff point of 69-50 is presented in Figure 3.

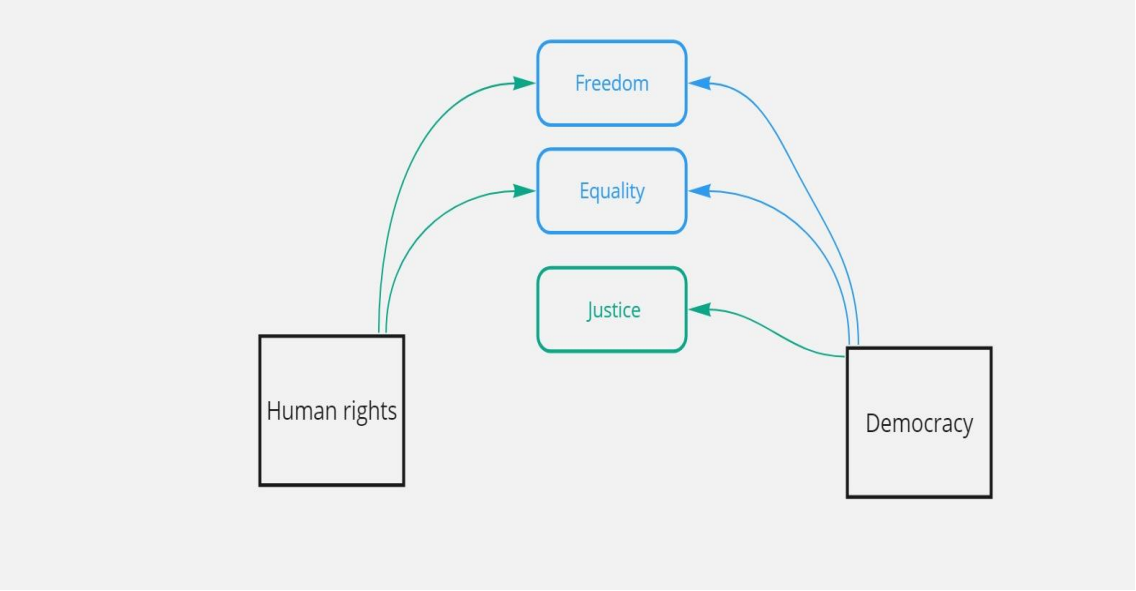


**Figure 3.** Concept map for the cutoff point of 69-50

The concept map in Figure 3 for the cutoff point of 69-50 indicatedthat the participants generated words regarding human rights. The words associated with human rights included equality and freedom, which were previously generated in the higher cutoff range (70 and above) in relation to democracy. As for democracy,

the word justice was generated. However, since the word justice was only generated in relation to democracy in this range, no direct correlation between the concepts could be established in the study.

The concept map generated for the cut-off point 49-30 is presented in Figure 4.

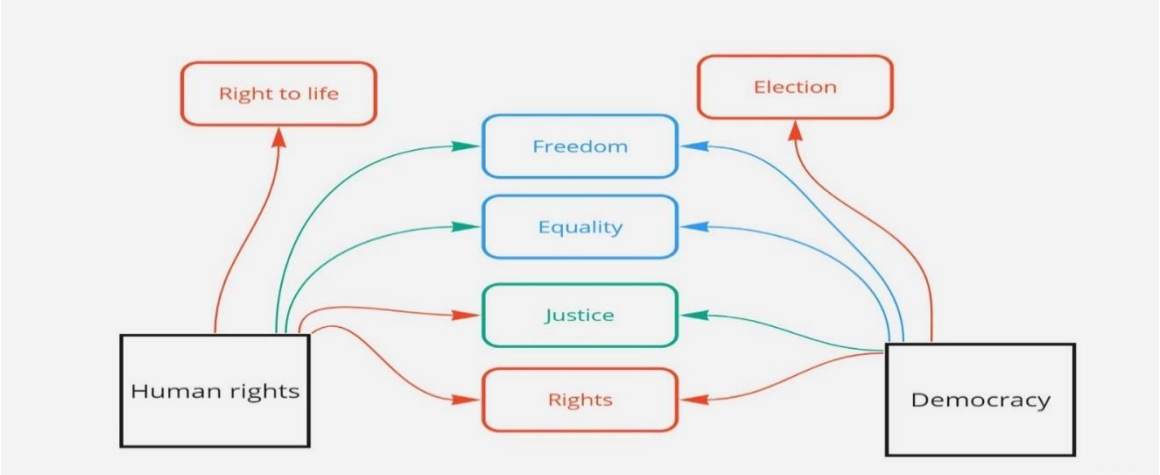


**Figure 4.** The concept mapfor the cut-off point 49-30

The the concept map presented in Figure 4 for the threshold 49-30 indicated that the participants generated words related to human rights, specifically the right to life and justice. The word "justice," which is associated with human rights, was previously used in the threshold range (69-50) for democracy. Furthermore, the word "election" was generated regarding democracy. The word "rights" was associated with both human rights and democracy.

The concept map generated for the cut-off point 29-10 is presented in Figure 5.

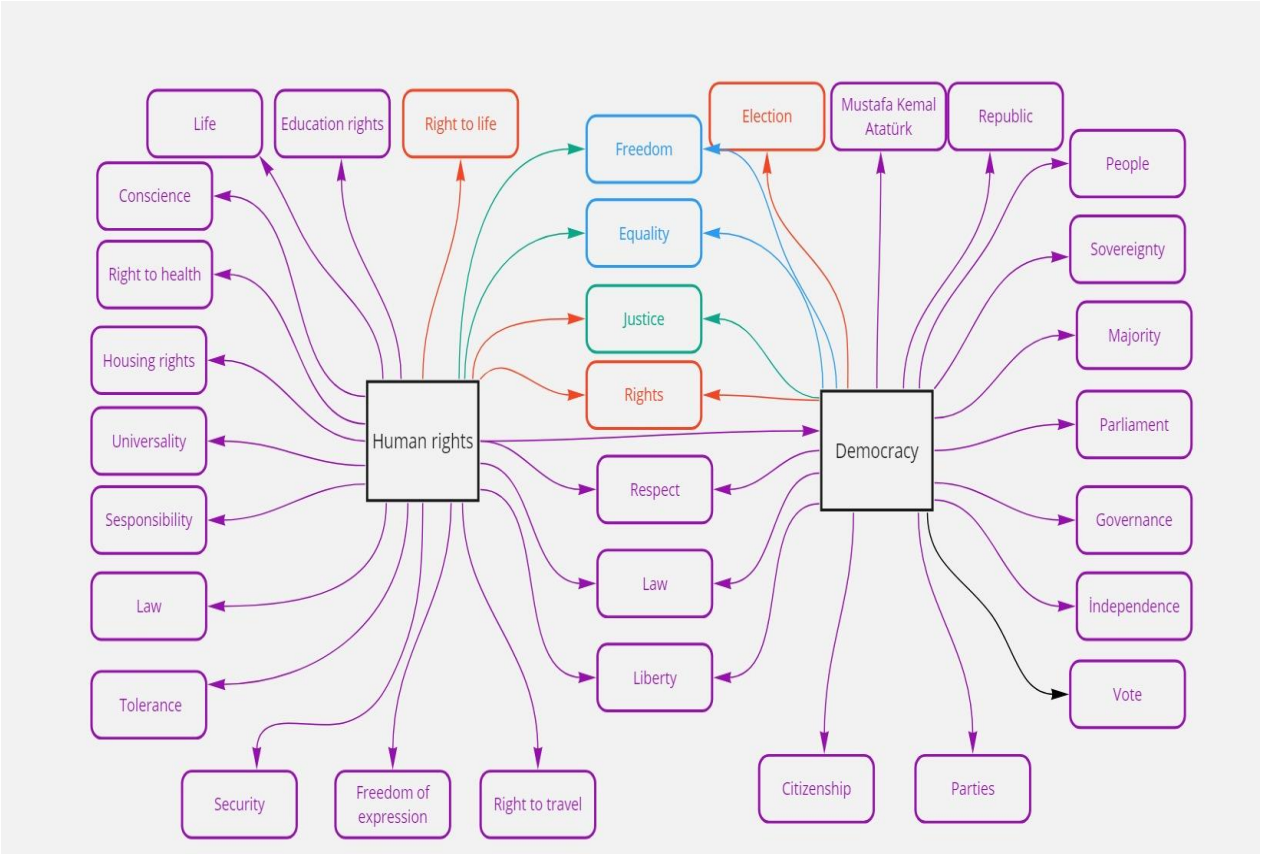


**Figure 5.** The concept map for the cut-off point 29-10

In the concept map presented in Figure 5 for the cut-off point 29-10, there was an increase in the generated words related to the concepts of human rights and democracy. Regarding human rights, words such as education rights, life, conscience, right to health, housing rights, universality, responsibility, law, tolerance, security, freedom of expression and right to travel were produced. In this cutoff range, human rights was associated with democracy. The participants generated words such as Mustafa Kemal Atatürk, republic, people, sovereignty, majority, parliament, governance, independence, vote, parties, and citizenship for democracy. The words respect, law and liberty were produced in connection with both the concepts of human rights and democracy.

**Table 2.** The sentences constructed by the participants about human rights and democracy concepts.

| Concepts | Number of sentences containing scientific knowledge (f) | Number of sentences containing non-scientific or superficial knowledge (f) | Number of sentences containing conceptual misconceptions (f) | No Answer |
|---|---|---|---|---|
| Human Rights | 73 | 19 | 1 | 1 |
| Democracy | 69 | 18 | 6 | 1 |

According to Table 2, it can be observed that the number of sentences constructed by the participants regarding human rights was 73 for scientifically informed sentences, 19 for non-scientific or superficial information sentences, 1 for sentences containing conceptual misconceptions. In addition, one participant did not construct any sentences. For democracy, the number of scientifically informed sentences was 69, the number of non-scientific or superficial information sentences was 18, and the number of sentences containing conceptual misconceptions was 6. One participant did not produce a sentence related to democracy. The constructed sentences by the participants indicated that they possessed knowledge about democracy and human rights.

The participants provided the following explanations in the form of scientifically informed sentences regarding human rights: "*Human rights are internationally protected*," (P1M. G3.) "*Human rights are the fundamental rights that individuals acquire from birth and form the basis for living a humane life, ensuring the freedom of individuals to live without restricting their freedom*,"(P3F. G3.), and "*Human rights are the rights that everyone possesses simply because they are human*."(P20F. G3.). The participants expressed their thoughts regarding human rights by providing non-scientific or superficial information: "*Human rights are the rights that individuals have based on the countries they are born in, although they are claimed to be universal. These rights are subject to certain rules from the moment of birth until death*." (P15F. G3.), "*Human rights are a concept that remains merely theoretical and not applied in many sectors today*." (P25F. G3.), "*Human rights enable individuals to feel valuable*."(P81F. G4.). The participant who made a conceptual error described human rights as "a set of things that everyone should have at an average level."(P48M. G4.). The participants also expressed their thoughts regarding democracy by providing scientific information: "*Democracy is the principle where everyone is equal regardless of their economic status and everyone has the right to vote and be elected*." (P12F. G3.),"*Democracy is a form of self-governance by the people*." (P19F. G3.), "*Democracy is the self-governance of the people based on the principle of equality where the rights of the majority and minority are protected, as represented by the elected representatives*." (P29F. G3.), and "*Where there is democracy, there is respect for freedom of thought and human rights*." (P42M. G4.). Furthermore, the participants provided non-scientific or superficial information for democracy: "*The best environment for a person to live in can be achieved through democracy*." (P4F. G3.), "*Democracy is essential for societies that aim for humane living*." (P31M. G3.), and "*Democracy is one of the dominant ideologies in today's world*." (P20F. G3.). These statements lacked depth and fail to provide a comprehensive understanding of democracy. They reflected a surface-level or subjective view rather than grounded in scientific knowledge. In addition, some participants exhibited

misconceptions regarding democracy: "*I think it's about law*." (P3F. G3.), and "*It regulates the relationships between individuals and states*." (P74F. G4.).

## Conclusion, Discussion, Recommendations

A knowledgeable and skilled workforce serves as the driving force behind societies. The cornerstone of such a workforce is built upon receiving quality education, effective teaching programs, and comprehensive training for the teachers who implement these programs. In the context of pre-service teacher education, there is an expectation that pre-service teachers (PSTs) not only gain specific knowledge but also cultivate essential values. In this sense, Çevik-Kansu (2017) states that in constantly evolving and transforming societies, teachers have significant responsibilities in fostering effective democratic citizens and imparting critical thinking skills to learners. Therefore, the pre-service teacher education and perceptions and understandings of PSTs are considered crucial. In this study, the cognitive perceptions of pre-service social studies teachers regarding the concepts of human rights and democracy were investigated. The findings revealed that the concepts of equality and human rights were the most frequently emphasized by the participants. Similarly, the words most commonly associated with the concept of democracy were also equality and freedom. A study conducted by Duman (2008) on students from the faculty of education revealed that the participants associated the concepts of democracy and freedom. In a similar study focusing on the concept of democracy, pre-service social studies teachers were asked to provide their interpretations, and they explicitly stated that democracy can be explained by equality (Yılmaz & Akgün, 2019). Another study conducted on PSTs revealed that they were able to establish connections between the concepts of democracy and human rights, indicating that they had awareness regarding democracy and human rights (Çelebi, 2021). In another study with a similar context, it was found that PSTs developed the highest number of metaphors related to the theme of equality (Sarı & Sadık, 2011). Another study, on PSTs and their use of metaphors, highlighted that the participants primarily viewed democracy as a form of governance. However, it emphasized the importance of understanding democracy not only as a system of governance but also as a way of life intertwined with human rights (Yağan-Güder & Yıldırım, 2014). In a study conducted on teachers, it was found that they emphasized the concept of equality the most when indicating the elements of democracy. They stated that equality was crucial from a democratic perspective in social, political, economic, and educational domains (Şahin & Kılıç, 2020).

In the present study, the participants repeated the following words regarding human rights: right to life, right to education, life, conscience, right to health, right to housing, universality, responsibility, law, tolerance, security, freedom of expression, right to travel and democracy. They also used the following words for the concept of democracy: election, Mustafa Kemal Atatürk, republic, people, sovereignty, majority, parliament, governance, independence, vote, political parties, citizenship. Şahin, Ökmen, and Kılıç (2020) conducted a study involving graduate students enrolled in a course on democracy and human rights. The findings revealed that the concept of election was consistently associated with the concept of democracy both before and after the course.

In the present study, the words freedom, equality, justice, rights, respect, law and liberty were associated with both the concepts of human rights and democracy. Indeed, the World Conference on Human Rights emphasized the intrinsic interconnectedness and mutually reinforcing nature of human rights and democracy. It highlighted the essentiality of usinghuman rights and freedoms for the effective existence of democracy (Beetham & Boyle, 1998). Yeşilçayır (2019) further asserts the indispensable relationship between human rights and democracy, noting that these two concepts are commonly intertwined and referenced together in society.

The examination of the sentences constructed by the participants regarding the concepts of human rights and democracy revealed that the number of sentences containing scientific knowledge was generally high. In this context, it can be said that the participants had knowledge about both concepts. However, it was

found that there were more sentences containing scientific knowledge about the concept of human rights compared to the concept of democracy. In other words, the participants interpreted the concept of human rights more accurately than the concept of democracy and expressed themselves adequately in this regard. In another study conducted on PSTs, it was found that pre-service social studies teachers have a positive attitude towards human rights education (Karatekin, Merey, Sönmez & Kuş, 2012). Similarly another study focused on pre-service social studies teachers and examined the metaphors they formed in relation to the concept of democracy. The findings revealed that PSTs exhibited familiarity with the concept of democracy and displayed an awareness of its conceptual structure (Gömleksiz, Kan & Öner, 2012). It is crucial for PSTs to cultivate democratic attitudes in preparation for their future profession. In this regard, the cognitive and affective internalization of both the concepts of human rights and democracy by PSTs, as future educators, will have a profound influence on their classroom practices and interactions with students. In this sense, Elkatmış and Toptaş (2015) emphasized the significance of developing democratic attitudes as a cognitive and affective process, suggesting the need for periodic examination of these attitudes to assess progress. In line with this perspective, it is important to note that although this study on PSTs primarily focuses on cognitive processes and structures, the presented findings also shed light on the affective aspect.

Taking into account all of the findings, particular attention should be given to the statements made by PSTs that demonstrate a lack of scientific knowledge or exhibit superficial information and conceptual misconceptions. It is crucial to investigate the underlying reasons for these issues and address any shortcomings in the learning process. Furthermore, evaluations pertaining to democracy and human rights should be explored through studies conducted with PSTs across various grade levels and teaching fields. Similarly, similar studies can be conducted with different concepts to gain a more comprehensive understanding.

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# Comparison of Problem Solving Skills for Reflective Thinking Skills of Students Who Did and Didn't Get Education in Science and Art Centers

*Research Article*

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ABSTRACT

Individuals encounter events waiting for a solution at every stage of life. The way they approach these events is directly related to their problem-solving skills. Especially in interpersonal relations, it is necessary to be a good listener in order to understand and respond to others. Individuals who can analyze what they listen to, find solutions to problems in this direction and reflect them on their lives can have a more positive self-perception. Positive self-perception contributes to the success of the individual in both social and academic life. Considering these issues, a study based on the relational screening model was conducted with 242 children who are not identified as gifted and 74 who are identified gifted children attending the 7th grade in the 2022-2023 academic year. The study was carried out in 3 public schools and 4 Science and Art Center in Istanbul. The listening comprehension test and the reflective thinking scale based on problem solving were used to collect the data. Data were analyzed with SPSS 22. package program. According to the results obtained, there is a negative relationship between the listening comprehension skills of the participants and their reflective thinking skills for problem solving.



**Keywords:** Who are identified as gifted, who are not identified as gifted, listening comprehension, problem solving, reflective thinking.

## Introduction

Every day, we are faced with countless problems waiting to be solved in all areas of life. The quality of the steps taken towards their solution directly affects the success of the individual. For this reason, it is important to teach problem solving and reflecting the qualifications obtained by solving these problems to life, while providing education in line with the achievements determined in the education-teaching process.

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Considering that listening is the most used communication tool in all areas of life, the necessity of teaching the listening comprehension skills and problem solving skills in harmony with each other/training to develop them together becomes necessary. In particular, in order to support the academic success of the students, while the acquisitions for understanding what they are listening are included, ensuring that the student focuses on solving a problem in the process of acquiring these gains and ensuring that he/she reflects the skills acquired from this to his/her life are important aspects of quality education. In this case, it is necessary to look at the definition of the problem: While the problem, the encountered problem, is described as an obstacle (Develioğlu, 2006; Yıldız, 2003; Cüceloğlu, 1997), the positive result achieved as a result of the effort to remove this obstacle can be described as problem solving. Problem solving skills require competent use of cognitive abilities. Problem solving skill, which has an important place in the development of higher-order thinking skills, also increases the self-confidence of individuals. They are more developed spiritually because they can transfer their experiences to different points of life and develop their skills to produce solutions (Karakuş, 2000; Charles & Lester, 1984). This situation enables them to make efforts to produce with more self-confidence academically. According to Kalaycı (2014), who stated that there is not an adequate infrastructure in this regard in the Turkish education system, training should be given on the ways of problem solving for the development of students' problem solving skills. Unless students are taught ways to solve problems, success should not be expected from them (Kalaycı, 2014). As children discover ways to solve problems, they reflect them in their lives and reach their goals more consciously. This concept of reflection is also described by Dewey (1933) as a whole consisting of suggestions, problems, hypotheses, reasoning and testing (as cited in Kızılkaya & Aşkar, 2009). Hinett (2002) describes this process as a movement in which individual, content and experience come together. When reflective thinking based on problem solving is taken into account as a whole, the student discovers different ways and learns to overcome problems as he/she strives to solve the problems he/she encounters. Since his cognitive skills are active in this learning process, he/she gets the opportunity to develop many skills such as critical thinking, creative thinking and reflective thinking, which are among high-level thinking skills, as he/she strives for different solutions. As the student solves problems, he/she reflects his experiences to other points of his/her life, so that he/she can effectively use his/her reflective thinking skills based on problem solving. It is important to meet the needs of who are identified as gifted students, who have higher level thinking potential compared to their peers, in the education process. It is necessary to provide differentiated education for the development of reflective thinking skills based on problem solving and to provide opportunities for them to realize themselves. Because, according to Yorulmaz (2006), making use of reflective thinking in education means providing opportunities for students to express their feelings and thoughts, to think creatively, and to develop high-level thinking skills. Based on this situation, using these skills in the education of who are identified as gifted students means providing them with the conditions they need. One of the defining characteristics of who are identified as gifted students is their listening skills (Bisland, 2004). Because they are curious, they try to discover what is happening around them at a very early age. This curiosity enables them to have a wide vocabulary at an early age (Pinker, 1984). Since the earliest language skill to develop is listening, this tool they use as a receiver is more advanced than their peers. According to the research of Catron and Wingenbach (1986), who are identified as gifted children have more advanced listening skills than their peers. This situation enables them to develop other language skills (Oğurlu, Yaman, 2010). At the same time, their developed listening skills also affect their cognitive development (Simkins, 2009). In other words, as their language skills improve, their cognitive skills also develop (Tortop, 2015; Şengül, 2015. Developing cognitive skills also improve awareness of higher-order thinking skills. It is important that both who are identified as gifted and who are not identified as gifted individuals have the educational environments they need for the development of their language skills and higher-order thinking skills. For this, first of all, it is necessary to determine what they need in education. Since language forms the basis of all education, it is important to create qualified educational environments for language development. Listening skill is the most used language skill in all areas of life. As this skill develops,

it is inevitable that students will progress both in their academic success and in the development of their life skills. It is important to determine the needs of the students before the trainings for the students. In this study, it was aimed to determine the problem-solving skills based on listening and reflective thinking, the relationship between these skills, and the relationships between these skills and demographic information, which has an important place in education, of who are identified as gifted and who are not identified as gifted students in 7th grade with the relational screening model. It is aimed to present data and make suggestions to the educational activities to be carried out by considering the results to be obtained from here, to the educators who want to differentiate the teaching process according to individual differences in the education-training process, to the researchers who want to reveal deeper information in this field. In line with the purpose, the following research problems were included:

-Is there a significant relationship between the participants' listening comprehension and their reflective thinking skills based on problem solving (RTSPS)?

-Is there a relationship between the participants' pre-school education and their listening comprehension skills?

-Is there a relationship between the participants' pre-school education and their reflective thinking skills based on problem solving (RTSPS)?

-Is there a relationship between the gender of the participants and their listening comprehension skills?

-Is there a relationship between the gender of the participants and their reflective thinking skills based on problem solving (RTSPS)?

-Is there a relationship between the participants' reading comprehension skills and the book they read annually?

-Is there a relationship between the book that the participants read annually and their reflective thinking skills based on problem solving (RTSPS)?

-Is there a relationship between the education levels of the participants' parents and their reflective thinking skills based on problem solving (RTSPS)?

-Is there a relationship between the participants' working status of parents and their listening comprehension skills?

-Is there a relationship between the participants' working status of parents and their reflective thinking skills based on problem solving (RTSPS)?

## Methodology

In the method of the research, information about the model used in the research, the sample group, the tools used in obtaining the data, the data collection process and the analysis of the data were included.

### Model of the Research

This study was conducted based on the relational screening model of the quantitative research method. Relational screening model is a model used to determine the changes and the degree of changes between more than one variable (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz & Demirel, 2018; Karasar, 2016). In this study, it was decided to use the relational screening model since it was aimed to determine the change between more than one variable.

**Sample/Research Group**

The study groups are 7th grade students studying in 3 public schools and 4 Science and Art Center in Istanbul in the 2022-2023 academic year. The number of students of who are not identified as gifted is 242 and the number of who are identified as gifted students is 72. Study groups were determined by convenient sampling method. Convenient sampling was preferred because it provides convenience to the researcher in terms of time, labor and cost. This sampling is used when the population is very large or when it is not possible to reach the sample (Monette, Sullivan, De Jong, 1990). Appropriate sampling method was preferred according to the purpose of the research. Demographic information of the study group is given in Table 1.

**Table 1.** Demographic information of the sample group

| | **Who are notidentified as gifted** | **f** | **%** | **Who are identified as gifted** | **f** | **%** |
|---|---|---|---|---|---|---|
| **Gender** | Female | 111 | 45.9 | Female | 47 | 65.3 |
| | Male | 131 | 54.1 | Male | 25 | 34.7 |
| | Total | 242 | 100.00 | Total | 72 | 100.00 |
| **pre-school education** | Yes | 98 | 40.5 | Yes | 59 | 81.9 |
| | No | 144 | 59.5 | No | 13 | 18.1 |
| | Total | 242 | 100.00 | Total | 72 | 100.00 |
| **number of books read** | 1-10 | 107 | 44.2 | 1-10 | - | - |
| **annually** | 11-20 | 64 | 26.4 | 11-20 | - | - |
| | 21-30 | 44 | 18.2 | 21-30 | 17 | 23.6 |
| | 31-40 | 17 | 7.0 | 31-40 | 24 | 33.3 |
| | 41 or above | 10 | 4.1 | 41 or above | 31 | 43.1 |
| | Total | 242 | 100.00 | Total | 72 | 100.00 |
| **mother working status** | Yes | 89 | 36.8 | Yes | 26 | 36.1 |
| | No | 153 | 63.2 | No | 46 | 63.9 |
| | Totsl | 242 | 100.00 | Total | 72 | 100.00 |
| **father working status** | Yes | 220 | 90.9 | Yes | 57 | 79.2 |
| | No | 22 | 9.1 | No | 15 | 20.8 |
| | Total | 242 | 100.00 | Total | 72 | 100.00 |
| **mother education** | Middle School | 120 | 49.6 | Middle School | 10 | 13.9 |
| **status** | High school | 101 | 41.7 | High school | 48 | 66.7 |
| | University | 21 | 8.7 | University | 14 | 19.4 |
| | Total | 242 | 100.00 | Total | 72 | 100.00 |
| **father education status** | Middle School | 111 | 45.9 | Middle School | 13 | 18.1 |
| | High school | 99 | 40.9 | High school | 42 | 58.3 |
| | University | 32 | 13.2 | University | 17 | 23.6 |
| | Total | 22 | 100.00 | Total | 72 | 100.00 |

According to Table 1, 111 of the 242 students of who are not identified as gifted are girls and 131 are boys. While 98 of them received pre-school education, 144 did not receive pre-school education. While 107 people read 1-10 books a year, 64 people 11-20 books a year, 44 people read 21-30 books a year, 17 people read 31-40 books a year, and 10 people read 41 or more books a year. While the mothers of 89 people are working, the mothers of 153 are not working. While the fathers of 220 people are working, the fathers of 22 people are not working. Mothers of 120 people are secondary school graduates, 101 people are high school graduates and 21 people are university graduates. Fathers of 111 people are secondary school graduates, 99 people are high school graduates, and 32 people are university graduates. 47 of the who are identified as gifted students are girls and 25 are boys. While 59 received pre-school education, 13 did not receive pre-school education. While 17 of them read in the range of 21-30 per year, 24 of them read in the range of 31-40 per year, 31 people read

41 or more books per year. While the mothers of 26 of them are working, the mothers of 46 of them are not working. While the father of 57 of them is working, the father of 15 of them is not working. The mothers of 10 are secondary school graduates, 48 of them are high school graduates, and 14 of them are university graduates. The fathers of 13 are secondary school graduates, 42 of them are high school graduates, and 17 of them are university graduates.

**Data Collection Tools**

Personal information form: For the purpose of the research, information about gender, working status of mother and father, education level of mother and father, number of books read annually are included.

**Reflective thinking scale based on problem solving:** It was developed by Kızılkaya and Aşkar (2009). It has three sub-dimensions: inquiry, evaluation and reasoning. The 14-item scale is a 5-point Likert-type (5=always, 4=often, 3=sometimes, 2=rarely, 1=never) scale. The lowest score that can be obtained from the scale is 14, and the highest score is 70. The Cronbach's alpha internal consistency coefficient of the scale is 0.83.

**Listening comprehension test:** The listening comprehension test was developed by the researcher. In order to determine the listening comprehension skills of the 7th grade students of who are not identified as gifted and who are identified as gifted, listening texts prepared by the Ministry of National Education (MEB), which were used as a Turkish course book in 2016, were used. All books prepared as textbooks by the Ministry of National Education are inspected by the Board of Education and Discipline (TTK). The audited books are used as textbooks. Therefore, it has been decided to use the texts that have passed the TTK control. As informative texts from the books that were used as Turkish textbooks before, Mustafa Kemal's Cartridge, The Door that Opens to Eternity, The Story of Those Who Don't Give Up; As a narrative text, Anne Frank's Diary, Smart Son, Brochure texts were presented to expert opinion. It was delivered to 4 people who are experts in the field of Turkish education. While three of these experts work as faculty members at universities, one of them works as a Turkish teacher in MEB. For these experts to evaluate the texts, a rubric was prepared considering the listening/watching achievements in the Turkish Language Curriculum (MEB, 2019). The rubric is scored from 1 to 3. 1 = suitable, 2 = partially suitable, 3 = not suitable. In the calculation of the points given by the experts; The formula for the total number of concurring expert opinions x 100 / total number of concurring experts + total number of disagreeing experts was applied. It was decided to use an informative and a narrative text as listening texts. Three times the texts of these texts were presented to the expert opinion, and among these texts, the Smart Son listening text was the text that received the highest score as the narrative text, and the Door with the Window Opening to Infinity as the informative text. Based on these texts, 40 questions were created. 20 of these questions are open-ended and 20 are multiple-choice questions. In order to determine the appropriateness of these questions, the opinions of the experts who took part as experts in the selection of the texts were taken. In line with the opinions received, it was decided to evaluate 10 open-ended and 10 multiple-choice questions. A pilot study was conducted to confirm the compatibility of the listening/watching texts and the questions prepared based on them. For the pilot application, it was applied to 10 students attending the 7th grade of secondary school. During the application, it was determined that two questions contained ambiguous expressions and their arrangements were made. Finally, it was decided to use the listening comprehension test as a test consisting of 20 questions, 10 of which were open-ended and 10 were multiple-choice. 1 point is given for each correct answer in the test, and 0 points are given for the blank answer. The lowest score that can be obtained from the test is 0 and the highest score is 20. After the application, the researcher and two different Turkish teachers took part in scoring the open-ended questions. By taking the average of the scores given by three people, this average was evaluated as the score given to the questions.

After the open-ended questions were scored by the specified experts, the average value was determined by taking the average of the scores given by each expert. Accordingly, in the calculation of the scores given by the experts who scored the open-ended questions; The reliability of the scores was analyzed with the formula

of total number of scored x 100 / total number of scored questions + total number of unscored questions. The results obtained were finally examined and approved by an academician who is a professor in the field of Turkish education.

**Data Collection/Processing**

Personal information form, listening comprehension test and reflective thinking skill scale for problem solving were used to collect data. Ethics committee was applied by the researcher to conduct the research in line with ethical principles. Ethics committee approval was granted by Yıldız Technical University Social Sciences Institute on 29.03.2022 with the decision numbered 2022.03. Administrators, parents, teachers and students in the schools where the study was carried out were informed. Information was given that they could leave without giving any reason at any stage of the study, where participation in the research was based on volunteerism.

**Analysis of Data**

The measurement tools were answered by 281 who are not identified as gifted students, but only 242 students submitted the forms completely. Incompletely filled forms were not taken into consideration. 6 of the who are identified as gifted students were not evaluated because of deficiencies in their forms. The forms of 72 students were evaluated. The data obtained through the forms were analyzed with the SPSS 22. package program.

The reason why the SPSS 22. package program was preferred in the analysis is that the data obtained is based on a quantitative research. Thus, with the help of SPSS 22. package program, the mean, standard deviation p value of the groups and the differences between the groups were provided with numerical data.

## Findings

Findings related to the data obtained in this study, which is based on the relational screening model, are included.

**Table 2.** The relationship between gender and problem solving and listening comprehension skills

| **Who are not identified as gifted** | **Gender** | **N** | **X** | **S** | **t** | **p** |
|---|---|---|---|---|---|---|
| **Listening comprehension** | Female | 111 | 0.68 | 0.26 | -7.46 | 0.000 |
| | Male | 131 | 0.57 | 0.41 | | |
| **Questioning** | Female | 111 | 3.07 | 0.46 | -0.85 | 0.395 |
| | Male | 131 | 3.54 | 0.48 | | |
| **Evaluation** | Female | 111 | 3.46 | 0.57 | 0.48 | 0.634 |
| | Male | 131 | 3.52 | 0.59 | | |
| **Reasoning** | Female | 111 | 3.55 | 0.82 | -3.51 | 0.001 |
| | Male | 131 | 3.50 | 0.58 | | |
| **Total** | Female | 111 | 3.35 | 0.39 | 2.39 | 0.017 |
| | Male | 131 | 3.52 | 0.37 | | |
| **Who are identified as gifted** | **Gender** | **N** | **X** | **S** | **t** | **p** |
| **Listening comprehension** | Female | 47 | 0.57 | 0.15 | -0.54 | 0.586 |
| | Male | 25 | 0.59 | 0.14 | | |
| **Questioning** | Female | 47 | 3.65 | 0.56 | 2.27 | 0.026 |
| | Male | 25 | 3.32 | 0.62 | | |
| **Evaluation** | Female | 47 | 3.82 | 0.52 | 3.41 | 0.001 |
| | Male | 25 | 3.29 | 0.77 | | |
| **Reasoning** | Female | 47 | 3.86 | 0.65 | 2.42 | 0.018 |
| | Male | 25 | 3.50 | 0.47 | | |
| **Total** | Female | 47 | 3.77 | 0.47 | 3.39 | 0.001 |
| | Male | 25 | 3.36 | 0.51 | | |

According to Table 2, Who are not identified as gifted: Girls' listening comprehension skills are higher than boys. While there is a significant difference in favor of girls in the sub-dimension of reasoning, there is a significant difference in favor of boys in general in RTSPS. There was no significant difference between the groups in the sub-dimensions of inquiry and evaluation. Who are identified as gifted: There is no significant difference between the groups in listening comprehension skills. There is a significant difference in favor of girls in the sub-dimensions of questioning, evaluation, reasoning and in general RTSPS.

**Table 3.** The relationship between mother working status and RTSPS and listening comprehension skills

| **Who are not identified as gifted** | **Mother working status** | **N** | **X** | **S** | **t** | **p** |
|---|---|---|---|---|---|---|
| **Listening comprehension** | Yes | 89 | 0.74 | 0.23 | -5.92 | 0.000 |
| | No | 153 | 0.55 | 0.39 | | |
| **Questioning** | Yes | 89 | 3.08 | 0.45 | -0.69 | 0.000 |
| | No | 153 | 3.47 | 0.52 | | |
| **Evaluation** | Yes | 89 | 3.46 | 0.57 | -0.58 | 0.491 |
| | No | 153 | 3.51 | 0.60 | | |
| **Reasoning** | Yes | 89 | 3.49 | 0.51 | -3.39 | 0.557 |
| | No | 153 | 3.54 | 0.80 | | |
| **Total** | Yes | 89 | 3.33 | 0.36 | 4.19 | 0.001 |
| | No | 153 | 3.51 | 0.40 | | |
| **Who are identified as gifted** | **Mother working status** | **N** | **X** | **S** | **t** | **p** |
| **Listening comprehension** | Yes | 26 | 0.49 | 0.15 | -3.93 | 0.000 |
| | No | 46 | 0.62 | 0.12 | | |
| **Questioning** | Yes | 26 | 3.84 | 0.47 | 3.52 | 0.001 |
| | No | 46 | 3.36 | 0.60 | | |
| **Evaluation** | Yes | 26 | 3.90 | 0.35 | 2.59 | 0.011 |
| | No | 46 | 3.49 | 0.76 | | |
| **Reasoning** | Yes | 26 | 4.05 | 0.58 | 3.55 | 0.001 |
| | No | 46 | 3.55 | 0.57 | | |
| **Total** | Yes | 26 | 3.92 | 0.37 | 3.97 | 0.000 |
| | No | 46 | 3.46 | 0.53 | | |

According to table 3, who are not identified as gifted: His mother has a higher ability to understand what employees listen to. There is a significant difference in favor of those whose mothers are not working in the sub-dimensions of questioning, evaluation, reasoning, and in general RTSPS. Who are identified as gifted: There is a significant difference in favor of those whose mothers are not working in listening comprehension. There is a significant difference in favor of the mothers of the employees across the questioning, evaluation, reasoning sub-dimensions and RTSPS.

**Table 4.** The relationship between father working status and RTSPS and listening comprehension skills

| **Who are not identified as gifted** | **Father working status** | **N** | **X** | **S** | **t** | **p** |
|---|---|---|---|---|---|---|
| **Listening comprehension** | Yes | 220 | 0.63 | 0.37 | 1.68 | 0.001 |
| | No | 22 | 0.50 | 0.14 | | |
| **Questioning** | Yes | 220 | 3.36 | 0.52 | 3.74 | 0.000 |
| | No | 22 | 2.93 | 0.41 | | |
| **Evaluation** | Yes | 220 | 3.50 | 0.58 | 0.85 | 0.491 |
| | No | 22 | 3.39 | 0.56 | | |
| **Reasoning** | Yes | 220 | 3.53 | 0.72 | 0.87 | 0.557 |
| | No | 22 | 3.39 | 0.49 | | |
| **Total** | Yes | 220 | 3.46 | 0.39 | 2.67 | 0.001 |
| | No | 22 | 3.23 | 0.34 | | |
| **Who are identified as gifted** | **Father working status** | **N** | **X** | **S** | **t** | **p** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Listening comprehension** | Yes | 57 | 0.62 | 0.11 | 6.36 | 0.000 |
| | No | 15 | 0.41 | 0.11 | | |
| **Questioning** | Yes | 57 | 3.39 | 0.56 | -4.39 | 0.000 |
| | No | 15 | 4.08 | 0.45 | | |
| **Evaluation** | Yes | 57 | 3.52 | 0.67 | -2.93 | 0.004 |
| | No | 15 | 4.06 | 0.44 | | |
| **Reasoning** | Yes | 57 | 3.60 | 0.57 | -3.64 | 0.001 |
| | No | 15 | 4.21 | 0.60 | | |
| **Total** | Yes | 57 | 3.50 | 0.48 | -4.56 | 0.000 |
| | No | 15 | 4.11 | 0.36 | | |

According to Table 4, who are not identified as gifted: There is a significant difference in favor of those whose fathers work in the ability to understand what they are listening to. There is a significant difference in favor of those whose fathers are employed across inquiry, evaluation, reasoning and RTSPS. Who are identified as gifted: There is a significant difference in favor of those whose fathers work in the ability to understand what they are listening to. There is a significant difference in favor of those whose fathers are not working in terms of questioning, evaluation, reasoning and RTSPS.

**Table 5.** The relationship between mother education status and RTSPS and listening comprehension skills

| **Who are not identified as gifted** | **Mother educaiton status** | **N** | **X** | **S** | **F** | **p** | **Scheffe** |
|---|---|---|---|---|---|---|---|
| **Listening comprehension** | Middle School | 120 | 0.62 | 0.32 | 0.39 | 0.678 | |
| | High School | 101 | 0.60 | 0.38 | | | |
| | University | 21 | .67 | 0.37 | | | |
| **Questioning** | Middle School(1) | 120 | 3.18 | 0.50 | 13.81 | 0.002 | (1-2) |
| | High School(2) | 101 | 3.52 | 0.48 | | | (2-3) |
| | University(3) | 21 | 3.19 | 0.54 | | | |
| **Evaluation** | Middle School | 120 | 3.44 | 0.57 | 0.67 | 0.510 | |
| | High School | 101 | 3.53 | 0.60 | | | |
| | University | 21 | 3.51 | 0.57 | | | |
| **Reasoning** | Middle School | 120 | 3.46 | 0.52 | 1.18 | 0.307 | |
| | High School | 101 | 3.56 | 0.90 | | | |
| | University | 21 | 3.69 | 0.49 | | | |
| **Total** | Middle School(1) | 120 | 3.36 | 0.39 | 6.17 | 0.002 | (1-2) |
| | High School(2) | 101 | 3.54 | 0.38 | | | |
| | University(3) | 21 | 3.46 | 0.39 | | | |
| **Who are identified as gifted** | **Mother education status** | **N** | **X** | **S** | **F** | **p** | |
| **Listening comprehension** | Middle School | 10 | 0.57 | 0.09 | 0.51 | 0.604 | |
| | High School | 48 | 0.57 | 0.16 | | | |
| | University | 14 | 0.61 | 0.11 | | | |
| **Questioning** | Middle School | 10 | 3.64 | 0.44 | 0.23 | 0.792 | |
| | High School | 48 | 3.50 | 0.63 | | | |
| | University | 14 | 3.57 | 0.62 | | | |
| **Evaluation** | Middle School | 10 | 3.90 | 0.32 | 1.21 | 0.302 | |
| | High School | 48 | 3.63 | 0.67 | | | |
| | University | 14 | 3.47 | 0.79 | | | |
| **Reasoning** | Middle School | 10 | 3.80 | 0.75 | 0.06 | 0.939 | |
| | High School | 48 | 3.72 | 0.55 | | | |
| | University | 14 | 3.71 | 0.78 | | | |
| **Total** | Middle School | 10 | 3.78 | 0.42 | 0.49 | 0.614 | |
| | High School | 48 | 3.61 | 0.52 | | | |
| | University | 14 | 3.58 | 0.59 | | | |

According to Table 5, who are not identified as gifted: There is no significant relationship between listening comprehension skill and mother education. In the abstraction sub-dimension, the questioning skills of those whose mothers are university graduates are higher than those whose mothers are high school graduates. Those whose mothers are high school graduates have higher RTSPS skills than those whose mothers are high school graduates. Who are identified as gifted: There is no significant relationship between maternal education status, questioning, evaluation, reason and RTSPS in general.

**Table 7.** The relationship between father education status and RTSPS and listening comprehension skills

| **Who are not identified as gifted** | **Father education status** | **N** | **X** | **S** | **F** | **p** | **Scheffe** |
|---|---|---|---|---|---|---|---|
| **Listening comprehension** | Middle School(1) | 111 | 0.57 | 0.41 | 3.17 | 0.044 | (1-2) |
| | High School(2) | 99 | 0.69 | 0.29 | | | |
| | University(3) | 32 | 0.59 | 0.32 | | | |
| **Questioning** | Middle School(1) | 111 | 3.58 | 0.46 | 26.64 | 0.000 | (1-2) |
| | High School(2) | 99 | 3.08 | 0.46 | | | (1-3) |
| | University(3) | 32 | 3.21 | 0.57 | | | |
| **Evaluation** | Middle School | 111 | 3.53 | 0.61 | 1.00 | 0.367 | |
| | High School | 99 | 3.43 | 0.56 | | | |
| | University | 32 | 3.54 | 0.56 | | | |
| **Reasoning** | Middle School | 111 | 3.53 | 0.86 | 0.18 | 0.835 | |
| | High School | 99 | 3.50 | 0.53 | | | |
| | University | 32 | 3.59 | 0.58 | | | |
| **Total** | Middle School(1) | 111 | 3.52 | 0.70 | 8.93 | 0.000 | (1-2) |
| | High School(2) | 99 | 3.54 | 0.38 | | | |
| | University(3) | 32 | 3.32 | 0.35 | | | |
| **Who are identified as gifted** | **Father education status** | **N** | **X** | **S** | **F** | **p** | |
| **Listening comprehension** | Middle School | 13 | 0.59 | 0.15 | 0.900 | 0.411 | |
| | High School | 42 | 0.59 | 0.14 | | | |
| | University | 17 | 0.53 | 0.15 | | | |
| **Questioning** | Middle School | 13 | 3.33 | 0.67 | 0.99 | 0.374 | |
| | High School | 42 | 3.55 | 0.64 | | | |
| | University | 17 | 3.64 | 0.43 | | | |
| **Evaluation** | Middle School | 13 | 3.71 | 0.60 | 0.08 | 0.918 | |
| | High School | 42 | 3.63 | 0.65 | | | |
| | University | 17 | 3.61 | 0.79 | | | |
| **Reasoning** | Middle School | 13 | 3.67 | 0.68 | 0.10 | 0.900 | |
| | High School | 42 | 3.76 | 0.61 | | | |
| | University | 17 | 3.72 | 0.65 | | | |
| **Total** | Middle School | 13 | 3.57 | 0.53 | 0.12 | 0.885 | |
| | High School | 42 | 3.64 | 0.55 | | | |
| | University | 17 | 3.65 | 0.48 | | | |

According to Table 7, who are identified as gifted: Those whose fathers are high school graduates have higher listening comprehension skills. Questioning skills of those whose fathers are secondary school graduates are higher than those whose fathers are high school or university graduates. RTSPS skills of those whose fathers are high school graduates are higher than those whose fathers are secondary school graduates. There is no significant relationship between listening comprehension and RTSPS and father education. Who are identified as gifted: There is no significant relationship between listening comprehension skill and the annual book read. Those who read 41 or more books a year have higher inquiry skills than those who read between 21-30 and 31-40 books a year. Those who read 41 or more books per year have higher assessment skills than those who read 21-30 books per year. Those who read 41 or more books a year have higher reasoning

skills than those who read 21-30 books a year and 31-40 books a year. Those who read 41 or more books per year have higher RTSPS skills than those who read 21-30 and 31-40 books per year.

**Table 8.** Anova test on the relationship between number of boks read per year and listening comprehension and RTSPS

| Who are not identified as gifted | Number of books read | N | X | S | F | p | Scheffe |
|---|---|---|---|---|---|---|---|
| **Listening comprehension** | 1-10(1) | 107 | 0.65 | 0.32 | 3.011 | 0.019 | (3-5) |
| | 11-20(2) | 64 | 0.57 | 0.41 | | | |
| | 21-30(3) | 44 | 0.68 | 0.31 | | | |
| | 31-40(4) | 17 | 0.59 | 0.33 | | | |
| | 41 or above(5) | 10 | 0.31 | 0.34 | | | |
| **Questioning** | 1-10(1) | 107 | 3.25 | 0.47 | 3.05 | 0.018 | (1-2) |
| | 11-20(2) | 64 | 3.50 | 0.58 | | | |
| | 21-30(3) | 44 | 3.21 | 0.56 | | | |
| | 31-40(4) | 17 | 3.38 | 0.47 | | | |
| | 41 or above(5) | 10 | 3.40 | 0.56 | | | |
| **Evaluation** | 1-10 | 107 | 3.53 | 0.56 | 1.41 | 0.229 | |
| | 11-20 | 64 | 3.53 | 0.59 | | | |
| | 21-30 | 44 | 3.34 | 0.57 | | | |
| | 31-40 | 17 | 3.39 | 0.66 | | | |
| | 41 or above | 10 | 3.72 | 0.71 | | | |
| **Reasoning** | 1-10 | 107 | 3.49 | 0.55 | 0.14 | 0.967 | |
| | 11-20 | 64 | 3.57 | 0.56 | | | |
| | 21-30 | 44 | 3.51 | 1.18 | | | |
| | 31-40 | 17 | 3.54 | 0.50 | | | |
| | 41 or above | 10 | 3.55 | 0.58 | | | |
| **Total** | 1-10 | 107 | 3.42 | 0.38 | 1.87 | 0.116 | |
| | 11-20 | 64 | 3.53 | 0.39 | | | |
| | 21-30 | 44 | 3.34 | 0.43 | | | |
| | 31-40 | 17 | 3.42 | 0.32 | | | |
| | 41 or above | 10 | 3.56 | 0.43 | | | |
| **Who are identified as gifted** | **Kitap** | **N** | **X** | **S** | **F** | **p** | **Scheffe** |
| **Listening comprehension** | 21-30 | 17 | 0.60 | 0.13 | 0.81 | 0.446 | |
| | 31-40 | 24 | 0.59 | 0.12 | | | |
| | 41 or above | 31 | 0.55 | 0.16 | | | |
| **Questioning** | 21-30(1) | 17 | 3.11 | 0.67 | 9.47 | 0.000 | (1-3) |
| | 31-40(2) | 24 | 3.47 | 0.42 | | | (2-3) |
| | 41 or above(3) | 31 | 3.81 | 0.54 | | | |
| **Evaluation** | 21-30(1) | 17 | 3.15 | 0.81 | 8.58 | 0.000 | (1-3) |
| | 31-40(2) | 24 | 3.63 | 0.41 | | | |
| | 41 or above(3) | 31 | 3.91 | 0.59 | | | |
| **Reasoning** | 21-30(1) | 17 | 3.47 | 0.59 | 6.90 | 0.002 | (1-3) |
| | 31-40(2) | 24 | 3.55 | 0.40 | | | (2-3) |
| | 41 or above(3) | 31 | 4.02 | 0.67 | | | |
| **Total** | 21-30(1) | 17 | 3.23 | 0.53 | 12.96 | 0.000 | (1-3) |
| | 31-40(2) | 24 | 3.55 | 0.31 | | | (2-3) |
| | 41 or above(3) | 31 | 3.91 | 0.49 | | | |

According to Table 8, who are not identified as gifted: Those who read 21-30 books a year have higher listening comprehension skills than those who read 41 or more books a year. Those who read 11-20 books a year have higher inquiry skills than those who read 1-10 books a year. Who are identified as gifted: As the number of books they read annually increases, their problem-solving skills for reflective thinking increase.

**Table 9.** Correlation analysis between listening comprehension and RTSPS

| **Who are not identified as gifted** | | *D* | *1Y* | *2Y* | *3Y* | *4Y* |
|---|---|---|---|---|---|---|
| **D** | r | 1 | -.252** | -.205** | -.008 | -.234** |
| | p | | .000 | .001 | .896 | .000 |
| **1Y** | r | -.252** | 1 | .244** | .054 | .635** |
| | p | .000 | | .000 | .402 | .000 |
| **2Y** | r | -.205** | .244** | 1 | .146* | .722** |
| | p | .001 | .000 | | .023 | .000 |
| **3Y** | r | -.008 | .054 | .146* | 1 | .614** |
| | p | .896 | .402 | .023 | | .000 |
| **4Y** | r | -.234** | .635** | .722** | .614** | 1 |
| | p | .000 | .000 | .000 | .000 | |
| **Who are identified as gifted** | | | | | | |
| **D** | r | 1 | -.306** | -.091 | -.178 | -.229 |
| | p | | .009 | .447 | .135 | .053 |
| **1Y** | r | -.306** | 1 | .564** | .637** | .887** |
| | p | .009 | | .000 | .000 | .000 |
| **2Y** | r | -.091 | .564** | 1 | .366** | .814** |
| | p | .447 | .000 | | .002 | .000 |
| **3Y** | r | -.178 | .637** | .366** | 1 | .770** |
| | p | .135 | .000 | .002 | | .000 |
| **4Y** | r | -.229 | .887** | .814** | .770** | 1 |
| | p | .053 | .000 | .000 | .000 | |

According to Table 9, there is a negative, moderately strong relationship between the listening comprehension skills of who are not identified as gifted students and their questioning skills (0.21<r<0.40) (r=-.252). There is a very low and negative correlation between listening comprehension skill and evaluation sub-dimension (0.00<r<0.20) (r=-.205). There is no significant relationship between listening comprehension skill and reasoning sub-dimension. There is a negative, moderately strong relationship between the ability to understand what is listening and reflective thinking based on problem solving in general (0.21<r<0.40) (r=-.234). There is a positive, moderately strong relationship between inquiry and evaluation sub-dimensions (0.21<r<0.40) (r=.244). There is no significant relationship between questioning and reasoning sub-dimensions. There is a strong positive correlation between the questioning sub-dimension and the overall reflective thinking towards problem solving (0.61<r<0.80) (r=-.635). There is a very low and positive correlation between the evaluation sub-dimension and the reasoning sub-dimension (0.00<r<0.20) (r=-.146). There is a strong positive correlation between the evaluation sub-dimension and the reflective thinking skills for problem solving in general (0.61<r<0.80) (r=-.722).

Who are identified as gifted; There is a negative, moderately strong relationship between listening comprehension skill and questioning sub-dimension (0.21<r<0.40) (r=-.306). There is no relationship between listening comprehension and evaluation sub-dimension, reasoning sub-dimension. There is no relationship between listening comprehension and reflective thinking skills for problem solving in general. There is a strong positive correlation between the questioning sub-dimension and the evaluation sub-dimension (0.61<r<0.80) (r=.637). There is a very strong positive correlation between the questioning sub-dimension and the reflective thinking skills for problem solving in general (0.81<r<0.100) (r=.887). There is a strong positive correlation between the evaluation sub-dimension and the questioning sub-dimension (0.41<r<0.60) (r=.564). There is a positive, moderately strong correlation between the evaluation sub-dimension and the reasoning sub-dimension (0.21<r<0.40) (r=.366). There is a very strong positive correlation between the evaluation sub-dimension and the reflective thinking skills for problem solving in general (0.81<r<0.100) (r=.887). There is a

strong positive correlation between the reasoning sub-dimension and the reflective thinking skills for problem solving in general (0.61<r<0.80) (r=.770).

## Conclusion and Discussion

According to the results obtained in this study, the listening comprehension skills of girls are higher in non-gifted students than bosy. In gifted students, there is no significant difference between the groups. In the study of Yıldırım (2007), who conducted a similar study on this situation, it was determined that girls' listening comprehension skills were higher than boys' listening comprehension skills. According to Çiftçi and Temizyürek, who conducted a similar study, the language skills of girls are higher than that of boys. According to the results of the same study, as the socioeconomic levels of the students increase, their success in these skills increases. Considering these issues, it is important to consider that the socioeconomic structures of the groups selected as the sample, the level of readiness of the students, and the attitudes of the students in the time period in which the research was conducted may also be effective in obtaining these results. The absence of any difference between groups in who are identified as gifted students can also be associated with similar results. Saranlı, Er, and Deniz (2017) conducted a study on the language skills of who are identified as gifted students in the pre-school period. According to the results obtained from the study, both receptive language skills and expressive language skills of boys are higher than girls. Considering these situations, as the age levels of the students increase, the difference between language skills may have changed depending on whether a suitable education model is offered or not in the educational environments they encounter. Or, the difference between the groups may have decreased because both gender groups were presented with conditions suitable for their developmental characteristics. For example, Çelikbaş (2010) taught listening strategies through classroom practices. At the end of the training, it was determined that there was no significant difference between gender and listening comprehension skills. This situation raises the possibility that a good listening education may have enabled the difference between the groups to disappear, since both gender groups have improved their listening skills. However, according to an experimental study conducted by Köklü (2003), girls' listening comprehension skills are higher than boys' listening comprehension skills. In Kaplan's (2004) experimental study, boys' listening comprehension skills were higher than girls' listening comprehension skills. While this situation shows that different educational environments may cause different results between genders, Doğan's (2007) experimental study for seventh grade students revealed that classroom practices for the development of listening skills were effective in the development of students' listening comprehension skills. A similar study was conducted by Yılmaz (2007). At the end of the study, the listening comprehension skills of the students in the experimental group were higher than those of the control group. When these situations are taken into consideration, it has been determined that positive results have emerged in all studies on the development of students' language skills. Although there are differences between the groups, it can be stated that the active status of the students is effective in the development of their listening comprehension skills. Since the results obtained from this research reveal a determination about the current situation, it can be stated that it is important in terms of providing data for new studies to focus on cause and effect relationships.

It was determined that the listening comprehension skills of the students whose parents were working in both groups participating in the study were higher than those whose parents did not work. It can be stated that the higher level of listening comprehension skills of students with working parents, the fact that students are individually responsible for their own work, which may affect their self-regulation skills. Thus, with the metacognitive, that is, the regulation of cognition, the student can have the opportunity to better structure what he or she does.

While there was no significant relationship between mother's education and listening comprehension skills in both participant groups, it was determined that students with normal intelligence had a higher rate

than students whose fathers were high school graduates. Considering the results of this research, it can be concluded that the students develop their listening comprehension skills through their own internal processes or formal education rather than the mother's education level in their developmental processes. However, the fact that the listening comprehension skills of the students whose fathers are high school graduates are higher than those whose fathers are secondary school graduates can be considered as an important result. Such a result also brings to mind the idea that the educational status of the father may be more determinant in the development of listening comprehension skills. It is important to carry out more detailed studies to reveal the reasons for this situation. For example, Yang (1998) made applications for the development of listening comprehension skills. It was determined that there was no difference in the intelligence divisions of the experimental and control groups, and the educational status of the parents. Based on Ateş's (1998) research, it can be stated that even the practices in formal education do not make a difference between parent education and the child's listening comprehension skills. It also reveals partial differences between this situation and the result of the current research. According to Kaya's (2012) research, the educational status of the parents of the 5th grade students is effective on their listening comprehension skills. In general, different research results revealed different results between parental education level and listening comprehension skill. It is thought that presenting studies based on more generalizable cause-effect relationships may help to reveal the reasons for the existing differences.

According to the results of the research, the listening comprehension skills of students with normal intelligence who read 21-30 books a year are higher than those who read 41 or more books a year. Who are identified as gifted, there is no significant difference between the groups. The results of this study show that as the number of books read by normal-intelligent children increases, their listening comprehension skills improve, while it does not make a significant difference in who are identified as gifted students. While this shows that children with normal intelligence are more sensitive to external stimuli, it can give a clue that who are identified as gifted students continue their development independently of external stimuli. Since who are identified as gifted students acquire language skills at an earlier age than their peers, perhaps they do not need an additional stimulus for these skills they already have. It brings to mind the thought that they are already sensitive to this situation. According to Arslan (2013), who conducted a study on children with normal intelligence, the number of books read affects the listening comprehension skills of seventh grade students. In other words, as the number of books read increases, their listening comprehension skills increase. Bulut (2013), on the other hand, revealed that active listening education has a positive effect on students' listening and reading comprehension skills. In other words, it is possible to state that encouraging students to read affects the development of other language skills as well as their reading comprehension skills. In addition, although the number of books read per year is high in children with normal intelligence, it is thought that the significant difference in favor of students who read less books may have affected the sample group, the conditions in which the study was conducted, and the readiness of the students. Karabacak (2014) determined that selective listening education improves students' listening comprehension skills. Considering the result of this research, it can be stated that the trainings to be given for the development of students' listening comprehension skills will also affect their reading comprehension skills, and as the number of books read increases, the students' listening comprehension skills will also increase. In addition, teaching effective strategies for the development of reading skills can also support the development of listening comprehension skills.

According to the results of the research, there is a significant difference in favor of girls in the reasoning sub-dimension of students who are not identified as gifted. In general, there is a significant difference in favor of boys in reflective thinking skills based on problem solving. While there is a significant difference in favor of boys in the reasoning sub-dimension of who are identified as gifted students, there is a significant difference in favor of boys in the questioning and evaluation sub-dimensions. In addition, there is a significant difference in favor of boys in general in reflective thinking skills based on problem solving. When the results are taken

into consideration, it is seen that girls in both groups tend to more causes, while boys show a more inclusive approach. In this case, it can be stated that girls have a more detailed perspective, while boys have a more general perspective. Considering these issues in the trainings to be made for the development of these skills of the students will contribute to the formation of qualified educational environments. Contrary to this research, Saygılı and Atahan (2014) revealed that there is no significant relationship between the problem-solving reflective thinking skills of who are identified as gifted students and gender. However, it has been determined that who are identified as gifted students have high reflective thinking skills for problem solving.

According to the study conducted by Uygun and Bilgiç (2018) on students who are not identified as gifted, there is a significant difference in favor of girls in general in reflective thinking towards questioning, evaluation, reasoning and problem solving. Aydın and Çelik analyzed reflective thinking skills for problem solving according to gender. Analysis results were significant in favor of girls. Şen (2011) also determined that there is a significant difference in favor of girls. Although the results of the current research are generally in favor of men, different results have been reached in different research results. In this case, it gives clues about taking into account the requirements such as demographic information, readiness level of students and taking into account their age. It also informs that the studies to be carried out should be more comprehensive and in a way that will reveal the cause-effects.

According to the study, there is no significant difference between the working status of mothers of students who are not identified as gifted and the evaluation sub-dimension. There is a significant difference in favor of the students whose mothers are not working in the sub-dimensions of questioning and reasoning. In general, there is a significant difference in favor of students whose mothers are not working in the RTSPS. There is a significant difference in favor of the students whose fathers work in the sub-dimensions of questioning and reasoning and in the overall RTSPS. There is a significant difference in favor of the students whose mothers work in the sub-dimensions of questioning, evaluation, reasoning and RTSPS in general in who are identified as gifted students. There is a significant difference between the sub-dimensions of inquiry, evaluation and reasoning in who are identified as gifted students and in favor of students whose fathers do not work in general in RTSPS. Considering the developmental characteristics of the students, the idea that children who are not identified as gifted may have developed more dependence on their families, especially their mothers, comes to mind. Since who are not identified as gifted children are more affected by external factors, their mothers' support for reflective thinking skills for problem solving and their role as an example may affect their skills in this regard. Who are identified as gifted students, on the other hand, make more efforts to reveal their potential when they are left on their own, which leads to the possibility of developing their skills in this regard. Since mothers are usually the primary caregivers, they can be in contact with the children the most. Participation of mothers in business life may cause children to spend effort to solve problems on their own. In addition, the absence of fathers of who are not identified as gifted students positively affects their skills in this field. The reason for this may be that the existing potentials of the students are supported more by the fathers. While mothers' supervisions may negatively affect students' skills in this area, fathers' attitudes may have affected them more positively. It is important to conduct new research in order to more clearly reveal the situations that led to the emergence of this finding, which is very important for both participant groups.

According to the results obtained from the study, inquiry skills and problem-solving reflective skills of the students whose mothers are high school or university graduates are higher in children who are not identified as gifted than those whose mothers are secondary school graduates. Questioning and reflective thinking skills of those whose fathers are secondary school graduates are higher than those whose fathers are high school or university graduates. This situation reveals contradictory results between the educational status of the parents and these skills of the students. These results, which are quite remarkable, show that an

evaluation should be made after revealing many different variables such as the educational qualifications of the parents, their adoption of their children and their attitudes towards them. These differences also require answers to questions about how they can result in working mothers and fathers. While no significant difference was found especially in who are identified as gifted students, it is noteworthy that these different results were revealed in who are not identified as gifted children. It can be stated that the justification of these situations can be an important basis for new research. According to Saygılı and Atahan (2014), who conducted research on who are identified as gifted children, there is no significant difference between parent education and reflective thinking skills for problem solving of who are identified as gifted children. Güneş (2015) also conducted a similar study. According to the research results of Güneş (2015), there is no significant difference between parental education and who are identified as gifted students' reflective thinking skills based on problem solving. According to the research results of Uygun and Bilgiç (2018), there is no significant relationship between mother education and RTSPS. These results support the current research results.

According to the results of the research, as the number of books read in a year increases in both who are identified as gifted and who are not identified as gifted students, students' inquiry skills increase. In other words, there is a significant relationship between the number of books read annually and inquiry skills. Similarly, as the number of books read in a year increases in who are identified as gifted students, there is a significant increase in reasoning, evaluation and RTSPS in general. Uygun and Bilgiç (2018) examined the relationship between the number of students' reading and their RTSPS skills. Accordingly, they determined that as the number of books they read increased, there was an increase in questioning, reasoning, evaluation and RTSPS in general. The research results of Gencal and Candan (2015) are similar: As the number of books read increases, students' RTSPS skills increase. In parallel with the increase in the number of books read in both groups, the significant results in their RTSPS and its sub-dimensions reveal the importance of reading books. Considering this situation, it is important that both schools and families support children in this regard. While the development of students' reading skills is supported, a significant amount of support is provided to the development of high-level thinking skills at the same time.

According to the results obtained from the research, there is a negative relationship between the listening comprehension skills of the who are not identified as gifted and who are identified as gifted and the general RTSPS. There is a positive relationship between the general intelligence and the sub-dimensions of RTSPS in individuals who are not identified as gifted and who are identified as gifted. Although significant correlations were found between the variables determined by the RTSPS and listening comprehension skill in the study, the determination of a negative relationship between listening comprehension and RTSPS is an important finding. The similar results in both groups indicate that new studies should be conducted for both groups of participants. These skills are skills that are frequently used in daily life. The negative relationship between them can negatively affect both academic and social skills of students. In order to eliminate these, it is important to integrate RTSPS-based trainings into the courses for the development of listening comprehension skills. The fact that there is a positive relationship between the RTSPS and its sub-dimensions in both study groups shows that RTSPS is actually related to each other and that they should be brought into the education-teaching process in a way that supports each other.

## Recommendations

### To families

Considering the results of the research, it is seen that the working conditions of the parents affect both the listening skills of the students and their reflective thinking skills for problem solving. The fact that there were significant differences in the reflective thinking skills for problem solving, especially of who are not identified as gifted children whose mothers were not working, reveals that the children in this group are

affected by their mothers' attitudes towards them. By taking this situation into account, families will support their children more positively and support their development.

In who are identified as gifted students, the work of their mothers positively affected their success in problem solving. This may result in more positive results as it allows children to spend more effort to activate their higher-order thinking skills when they are left on their own. This situation can also show the attitudes of mothers towards children. Children may hesitate to display these skills if there are parents who are more controlling towards their children. When they are independent, they can demonstrate these skills more easily. It is possible to interpret this situation for different reasons. Families can self-criticize themselves and support their children's development of problem-solving skills for both listening and reflective thinking.

There is an increase in the problem-solving reflective thinking skills of who are identified as gifted children whose fathers do not work. This shows that fathers may need to spend more time with their children for the development of children's higher-order thinking skills.

The fact that as the number of books read by children in both participant groups increases, both their problem-solving skills for reflective thinking and their listening comprehension skills increase, it may be beneficial to encourage children to read more books. Families can organize reading hours where they can read books as a family to support their children in this regard. Books that children will like can be who are identified as gifted to them. They can play games that improve both their higher-order thinking skills and their language skills.

In general, a negative relationship was determined between the problem solving skills of listening comprehension and reflective thinking. In order to eliminate the negativities of this situation, families can perform family activities for listening. They can do activities that develop both listening and higher-order thinking skills with digital content that children may enjoy.

**To Researchers**

Different results were obtained regarding the relationship between the gender of the participants and their reflective thinking skills for listening comprehension and problem solving. Conducting qualitative studies to reveal these results may contribute to revealing clearer results.

In addition, the situation of the practical work to be done on these skills to serve the purpose can be analyzed and suggestions can be made to the stakeholders accordingly.

While the RTSPS of normal-intelligent children are positively affected by the non-working status of their mothers, revealing the reasons why who are identified as gifted children's RTSPS are negatively affected by this situation may provide important contributions to the field.

Qualitative or mixed studies can be conducted to determine the reasons why the fathers of normal-intelligent children do not have any effect on their RTSPS, while the absence of fathers in who are identified as gifted students has a positive effect on their RTSPS.

The reasons for the negative correlation between the listening comprehension skills of both participant groups and the PDMS skills can be put forward.

Although it has been determined that reading has a positive effect on students' listening comprehension and RTSPS, reasons can be put forward for the negative relationship between listening comprehension and RTSPS.

This research only includes who are identified as gifted and normal-minded students who are in the 7th grade. For this reason, different grade levels can be determined as samples and the difference between the groups can be revealed.

In-class applications can be made to support the development of students' specified skills.

**To Teachers and Administrators**

Considering that there are differences in students' listening comprehension and RTSPS according to gender, these skills of both groups can be improved with in-class practices. Considering individual differences, applications that can appeal to all sense organs can be made.

Considering the effects of families on children's RTSPS and listening comprehension skills, studies can be carried out in cooperation with teachers and parents.

Parents can be guided to plan reading hours and activity hours with their children so that they can support the development of their children's listening comprehension and RTSPS.

**To Material Designers**

Considering that there is a negative relationship between students' listening comprehension and RTSPS, the materials used in the education process can be developed in a way that will serve their development.

Services can be provided for the use of mind and intelligence cards to reveal trainings to develop students' high-level thinking skills.

The current research results show how important the relationship between family and child is. Educational materials can be offered to families where family and children can play and have fun together.

**Ethics Committee Approval:**

Ethics Committee Permission

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# Teacher Perception in Society According to Social Studies Teachers

*Research Article*

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ABSTRACT

Education is very important for all societies. Through education, societies want to raise their individuals in the best way in order to survive. While the individual learns the social life by means of education; Societies adopt their historical, political and cultural characteristics to their members. However, education takes place in schools with systematic and planned teaching and learning activities. The first person responsible for teaching students the desired behaviors in schools and reinforcing the learned behaviors is the teacher. Not giving the needed value to the teachers in the society may cause the desired goals in education not to be achieved. For this reason, the aim of the research is to determine the 'perception of teachers in society' in line with the opinions of teachers. In line with the purpose of the research, this study was carried out in accordance with the basic qualitative research. The study group of this research consists of 25 Social Studies teachers working in secondary schools in Diyarbakır city center. In order to obtain data in the research, a semi-structured interview form developed by the researcher by consulting expert opinions was used. The data obtained at the end of the interview were analyzed by content analysis. As a result of the research, it has been concluded that teachers think that different professional groups have the perception of teachers, their salaries are insufficient, their free time is excessive, they have no professional difficulties, they are seen as an ordinary profession and everyone can teach. In addition, according to the participants, it was concluded that in the event of student failure, the responsibility is seen on the teacher; the teacher's evaluations are not taken into account, the child is above everything, and the parents have the perception that I know everything.



**Keywords:**
Teacher, Society, Social Perception

## Introduction

From past to present, education is very important for all societies. Because societies want to raise their individuals in the best way in order to survive. Raising individuals according to the expectations of the society is possible through education. At the same time, people learn to meet their own needs and lead a better life

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through education. While the individual learns the social life through education; Societies adopt their historical, political and cultural characteristics to their members. However, this education takes place in a systematic and planned way through teaching and learning activities in schools (Demirkol, 2023; Gül, 2004; Koçoğlu, 2014; Metin & Özcan, 2015; Pişkin & Parlar, 2019). Thanks to a systematic education, people learn the knowledge and skills which they can learn individually in a very long time, in a short time. In addition, thanks to these knowledge and skills, people can fully develop their abilities. For this reason, the education that individuals receive during the school process is important individually and socially. The first person responsible for teaching students the desired behaviors in schools and reinforcing the learned behaviors is the teacher (Başaran, 2007).

Teachers can affect their students emotionally, cognitively and psychomotorly. In fact, this effect positively affects not only the student but also the whole society (Tezcan, 2019). Because the good upbringing of individuals will contribute to the social integrity and ensure the continuity of the society. For this reason, societies want to train qualified teachers. Çelikten et al. (2005) describe teachers as architects who create the future of a country. Teachers are the ones who train the manpower serving in all segments of the society (engineers, drivers, lawyers, doctors, teachers, police, soldiers, etc.). Teachers have a very important role in the destiny of countries, as they completely affect the social structure. For this reason, the most basic element of the education system is the teacher. Teachers influence the development of a country. Teachers contribute to the establishment of social peace and social peace by influencing individuals. At the same time, teachers have many responsibilities in transferring the culture and values of the society to new generations (Banda & Mutambo, 2016; Çelikten et al., 2005; Gündüz, 2014; Koçoğlu, 2014). Likewise, Genç (2005) describes the teacher as an indispensable element of the order of educating individuals in all societies. Today, Genç says that since Teachers are seen as behavioral engineers, it is imperative that teachers should be trained as qualified educators in all aspects. Because Genç (2005) states that a qualified education is only possible with a qualified teacher. For this reason, Genç (2005) states that the importance of the teacher in terms of education can never be ignored.

Cerit (2008) stated that teachers shoulder a great responsibility due to the burden of an effective educational activity. According to Cerit, being a suitable educational environment in the classroom, using the tools and materials in the lessons, determining the activities, choosing and applying the teaching method suitable for each subject and learning level in the lesson are some of the responsibilities of teachers. The teacher, who fulfills these responsibilities, takes an active role in the classroom and has significant effects on students' personal behaviors and teaching.

When the literature is examined, it is seen that many studies have been done about the teaching profession before. In the examinations made, for the ideal teacher (Başaran & Baysal, 2016; Çalışkan et al., 2013; Çetin, 2001; Çetin & Ünsal, 2020; Kızıltepe, 2002; Özkan &Arslantaş, 2013; Üstüner et al., 2020); regarding teacher competencies (Başbay & Bektaş, 2010; Çelikten et al., 2005; Kahyaoğlu & Yangin, 2007; Seferoğlu, 2004; Yıldırım & Öner, 2016; Yılmaz & Gülçiçek, 2022) and the problems that teachers have experienced in their professional lives (Altun & Gülay, 2017; Çelik & Kahraman, 2021; Demir & Arı, 2013; Korkmaz et al., 2004; Özpınar & Sarpkaya, 2010; Öztürk et al., 2015; Ünal & Başaran, 2010; Ünsal & Bağçeçi, 2016; Yaraş & Turan, 2021 ); regarding the pre-professional education of teachers (Alpaydın et al., 2019; Argon et al., 2011; Baş & Nural, 2023; Gökçe, 2013; Özer & Alkan, 2017; Yayla, 2015) and the definition of teaching (Cerit, 2008; Ekici et al. 2017; Karataş, 2020; Kıral, 2015; Tezcan, 2019; Ünsal, 2021) many studies have been carried out. In reaching the desired goals in education, it is of great importance for teachers to be trained as qualified and to be experts in their fields. Because teachers can change the behavior of students by contributing to the development of students with the knowledge they have. For this reason, many different studies have been conducted on the teaching profession.

The perception of teachers in society is primarily formed by their attitudes and behaviors in the classroom. However, different views in social life can change the perspective of the teacher. The interaction of teachers with other people inside and outside the school and the news about teachers in the media can negatively affect the status of teachers in society. Not giving the necessary value to the teachers in the society may cause the desired goals in education not to be achieved. For this reason, the aim of the study is to determine the 'perception of teachers in society' in line with the opinions of teachers. Within the framework of this purpose, answers to the following questions were sought:

- ✓ Do you think that teachers receive a good education before starting the profession?
- ✓ What is the perspective of different professional groups on the teaching profession?
- ✓ What is the point of view on media towards the teaching profession?
- ✓ What is the perspective of parents on the teaching profession?
- ✓ How do students view the teaching profession?

## Methodology

### The Research Design

In line with the purpose of the research, this study was carried out in accordance with basic qualitative research, which is an approach that tries to examine and understand social phenomena and events according to their environment. The main purpose of qualitative research is to perceive the social life as a holistic part by taking into account the individual and benefiting from his/her feelings; At the same time, it is to account for the changes that occur in the society and the events that emerge (Yıldırım & Şimşek, 2011). In this study, the phenomenology design, which is one of the qualitative research methods, was used. Phenomenology focuses on discovering how people make sense of their experiences and how they transform their experiences into consciousness both individually and as shared meaning (Patton, 2014). In addition, phenomenological studies show us the results of our experiences and the reasons for perceptions and behaviors we have (Ersoy, 2017).

### Population and Sample

The study group of this research consists of 25 Social Studies teachers working in secondary schools in Diyarbakır city center. The study group of the research consists of teachers working in secondary schools with easily accessible sampling method. Social studies teachers, who benefit from different disciplines and whose main purpose is to raise active citizens, were determined as participants in order to achieve the purpose of the research. Demographic characteristics of the participants in this study are given in Table 1 below.

**Table 1.** Demographic Characteristics of Participating Teachers

| **Demographic Characteristics** | | **Participants** | |
|---|---|---|---|
| | | **n** | **%** |
| **Gender** | Female | 15 | 60 |
| | Male | 10 | 40 |
| **Age** | 30 or less | 2 | 8 |
| | between 31-40 | 16 | 64 |
| | 41 and above | 7 | 28 |
| **Professional Seniority** | 1-5 year(s) | 2 | 8 |
| | 6-10 years | 6 | 24 |
| | 11-15 years | 12 | 48 |

| | | | |
|---|---|---|---|
| | 16 and above | 5 | 20 |
| **Educational Level** | Bachalor's Degree | 24 | 96 |
| | Master Degree | 1 | 4 |

When looking at the demographic characteristics of the participants in Table 1, 60% of the participants, in terms of gender, are women and 40% are men. Looking at the age of the teachers in Table 1, it is seen that 8% of them are 30 years old and below, 64% are between 31-40 and 28% are 41 and over. Looking at Table 1, in terms of professional seniority, it is seen that 8% of the participating teachers are 1-5 year- experienced, 24% are 6-10 year-experienced, 48% are 11-15 year-experienced, and 20% are 16 and above. Looking at Table 1 regarding the education level of the participants, it is seen that 96% of the participating teachers are bachelor and 4% are postgraduates.

**Instruments**

In order to determine the opinions of social studies teachers about the perception of teachers in the society, a semi-structured which was developed by the researcher and consisting of two parted interview form was used. In the first part of the interview form consisting of two parts, there are instructions on how to fill out the form and questions that will reveal the demographic characteristics of the teachers. In the second part of the interview form developed by the researcher and after expert opinions were consulted, a semi-structured interview form consisting of five questions was prepared in order to determine the opinions of social studies teachers about the perception of teachers in the society. In the research, primarily the theoretical dimension was created. Afterwards, the researcher prepared the questions in the interview form as a result of field scanning and sought the opinion of four Social Studies training experts whether the suitability of the prepared questions for the purpose of the study. The researcher carried out the validity and reliability studies of the semi-structured interview form by seeking expert opinions.

**The Data Analysis**

In the study, a semi-structured interview form, which was prepared in order to reveal the opinions of social studies teachers about the perception of teachers in the society, was used. Content analysis was used to analyze the data obtained from the teachers after the interview. Some of the opinions obtained from the participants were included in the content analysis. In the analysis process, firstly by examining the opinions of the participants the sub-codes were reached. At the same time, while subcoding about all the interview forms (Teacher1), they were numbered as T1, T2, T3….

Since more than one sub-code could be reached from the answers given by the participant teachers, a number was given for each sub-code. All codings (including subcodings) were coded taking into account the answers given by the teachers. After sub-theme coding, themes were created with an inductive analysis. All subcodings took place without interruption during the analysis of the data. After waiting for two weeks after the creation of the themes, the data obtained from the participants were re-coded. Thus, it was checked whether a different result emerged as a result of both coding. The reliability of the data was tried to be ensured by this comparison.

**Ethics Committee Decision**

Ethical permission was obtained from Dicle University Social and Human Sciences Ethics Committee (date: 05.07.2022 - issue number: 319628) for this research.

## Findings

In this section, there are the findings obtained as a result of the analysis of the collected data and the comments made in line with these findings. These data collected in the findings section were handled holistically.

### Views of teachers on pre-vocational teacher education

In order to determine the opinions of the participants about the pre-vocational education, "Please explain do you think that the teachers receive a good education before starting the profession?" The question was asked to the teachers. The answers given by the teachers to the question asked are given in Table 2 below.

**Table 2.** The opinions put forward about the education that the teachers received before starting the profession.

| | | Sub Themes | Participant | f |
|---|---|---|---|---|
| **Pre-Vocational Teacher Education** | **Yes** | **G.1.** Suitable for Contemporary Education Concept | T2, T11, T16, T21, | 4 |
| | | **G.2.** Not to Improve Yourself Later | T4, T12, | 2 |
| | | **G.3.** Waiting for Assignment | T16, T24, | 2 |
| | **No** | **G.4**. Being Knowledge-Based | T1, T3, T6, T8, T9, T10, T13, T14, T15, T17, T18, T19, T20, T22 | 14 |
| | | **G.5**. Being Exam Oriented | T3, T7, T10, T14, T17, T20, T22 | 7 |
| | | **G.6.** Assignment Anxiety | T5, T23 | 2 |
| | | **G.7.** Lack of Equal Opportunities in Education Faculties | T25 | 1 |

Looking at Table 2, the participants were asked "Do you think that the teachers receive a good education before starting their profession?" It is seen that teachers gave different answers to the question. Some of the participants said yes to this question and answered as appropriate to the modern education understanding (f:4), but later on not improving oneself (f:2) and waiting for assignment (f:2). Some of the participants said no and answered that they were knowledge-based (f:14), exam-oriented (f:7), assignment anxiety (f:2) and education faculties do not have equal opportunities.

Some of the views from the answers given to the question "Do you think the teachers receive a good education before starting their profession?" are given below:

> "I think the pre-vocational education is good. But when teachers are appointed, they become complacent and do not improve themselves." (T4)

> "I think this is a subject that is discussed a lot, not only in the teacher training process, but the whole education and training process is knowledge-oriented and based on rote learning. After that, students study only for exams. While this situation makes the teacher candidate successful to pass the exams academically, unfortunately, that person does not have enough equipment in terms of professionalism." (T20)

> "Excessive assignment anxiety of teacher candidates prevents them from being successful. Because they are not motivated by the education given. When they have the thought that I can't be appointed anyway, they don't try to have professional competence." (T5)

Although the teachers participating in the research gave different answers regarding pre-vocational teacher education, it is seen that the participants who said 'yes' were mostly in line with the contemporary education understanding (f:4) in the sub-themes, while the participants who said 'no' agreed on the theme of

being knowledge-based (f:14). . In addition, it is seen that teachers generally express their opinions that a good education is not received regarding the pre-vocational education.

**Opinions on the Perspectives of Different Professional Groups towards the Teaching Profession**

In order to determine the views of the participants on the teaching profession of different professional groups, the question "What is the perspective of different occupational groups on the teaching profession, please explain?" was asked to the teachers. The answers given by the teachers to the question are given in Table 3.

**Table 3.** Opinions on the perceptions of different occupational groups

| | Sub Themes | Participant | f |
|---|---|---|---|
| **Teaching: According to Different Profession Groups** | **G.1**. İnadequate Teachers' Salaries | T1, T2, T5, T7, T8, T9, T13, T15, T16, T17, T18, T20, T21, T24 | 14 |
| | **G.2.** Excess Free Time | T3, T4, T8, T11, T12, T15, T17, T19, T22, T25 | 10 |
| | **G.3**. No Difficulties | T6, T14, T17, T21 | 4 |
| | **G.4.** Seeming As An Ordinary Profession | T9, T10, T23 | 3 |
| | **G.5**. Everyone Can Teach | T2, T10, T21 | 3 |

Looking at Table 3, it is seen that the participants, who were asked the question"What is the perspective of different occupational groups on the teaching profession, please explain?", gave different answers. The participants answered this question as inadequate teachers' salaries (f:14), excess free time (f:10), no difficulties (f:4), seeming as an ordinary profession (f:3) and everyone can teach (f:3).Some of participant views on the question "What is the perspective of different occupational groups on the teaching profession, please explain?" are given below:

> "Actually, truth be told, whoever we talk to in a different profession, they say that teachers are paid very low compared to all other workers. Life is very expensive and salaries must be at least at a certain level in order to maintain our lives. For example, while a retired teacher could buy a house or a car with a retirement bonus, this is a dream nowadays." (T7)

> "What everyone says is that teachers have a lot of free time and teaching is a very easy job. As a result, there is a thought that there is no difficulty in teaching and that teachers work comfortably."(T17)

> "Teaching is now seen as very ordinary and there is a prevailing belief that everyone can do this job. Although this understanding has been broken a little during the pandemic process, the general opinion is still valid." (T10)

Social Studies teachers gave various answers about the perspective of different professional groups towards the teaching profession, and it was seen that the answers were gathered under five sub-themes. Although the participants gave different answers to the question asked, they were mostly united in the sub-theme (f:14) of the inadequacy of teachers' salaries. Different occupational groups, while considering the teaching profession, primarily make comparisons over the salaries.

**Views On The Perspective Of The Media Towards The Teaching Profession**

In order to determine the views of the participants on the perceptions of the teaching profession in the media, the question "What is the point of view of the media towards the teaching profession, please explain?" was asked to the teachers. The answers given by the teachers to the question are given in Table 4.

**Table 4.** Opinions on the perceptions in the media

| | Sub Themes | Participant | f |
|---|---|---|---|
| **Perception of Teaching in the Media** | **G.1.** Perception of Always Taking Vacation | T1, T2, T3, T4, T5, T6, T8, T9, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21,T23,T24, T25 | 22 |
| | **G.2.** Teacher Salaries Are High | T4, T6, T11,T10, T17, T21, T23 | 7 |
| | **G.3.** Coming to The Fore With Violence | T2, T8, T14, T16, T18, T24, T25 | 7 |
| | **G.4.** View Teachers as İncompetent | T1, T13, T15, T22 | 4 |
| | **G.5**. Teacher Assignments | T7, T20 | 2 |

When Table 4 is examined, it is seen that participants gave different answers to the question "What is the point of view of the media towards the teaching profession?". The answers of the question consist of perception of taking vacations all the time (f:22), highness of salaries teachers' salaries are high (f:7), coming to the fore with violence (f:7), being seen as inadequate (f:4), and Too many teacher appointments (f:2).

Some of the views from the answers given to the question “What is the point of view of the media towards the teaching profession, please explain?” are given below:

> “The only thing we hear about teachers in the media is that we are always portrayed as if we are on vacation. But this is the case in all countries in the world. If such a situation were wrong, education would not be interrupted in Europe, America or Japan. Also, the holiday is presented as if it's just for teachers. They are students who really need a vacation.” (T9)

> “Teachers come to the fore with their salary more. If not one day the next day, a teacher's salary comes to the fore in a TV program or news site. The salary is shown to be high by adding the additional course fees . The salary of any profession (police, doctor, lawyer, etc.) is not even on the agenda properly. Also, when everyone comments on the teacher, they say ‘teachers take a lot of vacation’" (T23)

> “Teachers come to the fore most often with appointments on television, in the news and on social media. Many teachers are waiting for appointments and this turns out to be a social problem. People have diplomas, but they are unemployed and worry about the future. Many people who have received their diplomas cannot be appointed, so they work in different jobs. So, when they work in a different job, they are on the news; unemployed teachers work in construction, or farming. Of course, when this is the case, teaching is perceived as an useless profession in the society.” (T7)

It was seen that the teachers in the study group gave different answers about the perspective of the media towards the teaching profession, and the answers were gathered under five sub-themes. Although the participants gave different answers regarding the perception of the teaching profession in the media, they were mostly united in the theme of the perception of constantly taking a vacation (f:22). It is seen that the periods when teachers are not working are taken into consideration instead of the educational aspect and importance of the teaching profession in the media.

**Views on Parents' Perspective on Teaching Profession**

In order to determine the views of the participants on views of parents’ perspective on teaching professin the question “Explain what is the perspective of the parents on the teaching profession?” has been asked. The answers given by the teachers to the question are given in Table 5.

**Table 5.** Views on Parents' Perceptions

| | Sub Themes | Participant | f |
|---|---|---|---|
| Teaching Profession from Parents' Perspective | **G.1.** Not Being Given The Necessary Value | T1, T3, T4, T8, T9, T13, T14, T17, T19, T20, T23, T25 | 12 |
| | **G.2.** Seeming As a Baby-Sitter | T2, T4, T8, T11, T15, T22, T24 | 7 |
| | **G.3.** Blaming Teachers For Student Failure | T5, T7, T16, T21 | 4 |
| | **G.4**. Not Being Respected | T6, T11, T21 | 3 |
| | **G.5.** Not Taking Teacher's Evaluations İnto Consideration | T3, T12, T18, | 3 |
| | **G.6.** Holding The Child Above Everything | T10, T24, | 2 |
| | **G.7.** Having The İdea That "I Know Everything" | T7 | 1 |

When Table 5 is examined, it is seen that the participants gave different answers to the question "What is the perspective of the parents towards the teaching profession?". Participants answered this question not being given the necessary value (f:12), seeming as a baby-sitter (f:7), blaming teachers for student failure (f:4), not being respected (f:3), not taking teacher's evaluations into consideration (f:3), holding the child above everything (f: 2) and having the idea that "I know everything" (f: 1).

Participants were asked, "What is the perspective of parents towards the teaching profession, please explain?". Some of the views from the answers given to the question are given below:

> "Parents send their child, whom they cannot cope with at home, to school and in a way throw them out. And also they treat the teacher as a baby-sitter." (T2)

> "Parents do not take care of their children properly, and they blame the teacher in case of failure. It is as if teachers have a magic wand and they expect everything from the teacher." (T16)

> "Parents nowadays think they know everything about education. They do not take the evaluations of the teachers about their children seriously and accept the hearsay information they have learned from the environment as correct." (T7)

Although the teachers participating in the research gave different answers regarding the parents' perspective on the teaching profession, it was seen that they were mostly united in the theme of not giving the necessary value (f:12). According to the participants, parents state that teachers do not take student evaluations into consideration and have the idea that they know everything. However, in case of student failure, they see the responsibility on the teacher.

**Views on Students' Perspectives on Teaching Profession**

In order to determine the views of the participants about students' opinions on the teaching profession, the question "How is the students' perspective on the teaching profession?" was asked. The answers given by the teachers to the question are given in Table 6.

**Table 6.** Views about students' perceptions

| | Sub Themes | Participant | f |
|---|---|---|---|
| Teaching from the Student Perspective | **G.1.** Not Taking the Teacher Seriously | T2, T3, T5, T7, T8, T9, T10, T13, T15, T17, T18, T20, T22 | 13 |
| | **G.2**. Not Showing Respect To The Teacher | T1, T4, T7, T8, T11, T12, T16, T19,T21, T24 | 10 |
| | **G.3.** Thinking Of Being Able To Do Everything | T6, T23, T24 | 3 |
| | **G.4.** Teacher's Lack of Sanctioning Power | T14, T25 | 2 |

| | | | |
|---|---|---|---|
| **G.5.** The School's Place To Spend Time | T2 | | 1 |

Looking at Table 6, it is seen that teachers gave different answers to the question "What is the perspective of the students towards the teaching profession, please explain?" . Participants answered this question not taking the teacher seriously (f:12), not showing respect to the teacher (f:10), thinking of being able to do everything (f:3), teacher's lack of sanctioning power (f:2) and the school's place to spend time (f:1).

Some of the views from the answers given to the question, "What is the perspective of the students towards the teaching profession, please explain?", are given below:

> "Many students come to school not with the idea of education, but to get together and spend time with their friends. They don't take the teacher seriously because there is no failing class." (T2)

> "The students do not listen to the teacher in any way, they do not show the necessary respect." (T19)

> "Since grade repetition is abolished, students do not show the necessary interest in the lessons. The students thought that they wold pass their grade anyway and the teacher couldnot do anything." (T25)

Although Social Studies teachers give different answers regarding the students' perspectives on the teaching profession, it is seen that they mostly agree on the theme of not taking the teacher seriously (f:13). According to the participant teachers, the students do not take the teachers seriously and do not show the necessary respect due to the teacher's lack of sanction power.

## Discussion and Results

When we look at the results of pre-vocational teacher education, some of the teachers stated 'yes', while others said 'no'. While some of the teachers, who stated "yes", expressed that they received a good education, some others stated that they received education in accordance with the modern education approach and some of them stated that although they received a good pre-vocational education, they waited for a long time for appointment and then they did not develop themselves. Teachers, who stated "no" among the participants, stated the wievs, knowledge-based and exam-oriented education, assignment anxiety and education faculties not to have equal opportunities. In order for teachers to be qualified, they must be trained with the necessary knowledge and skills in the Bachelor's degree process. Well-trained and qualified teachers will increase the quality of education (Aykaç, 2012). As a matter of fact, the teaching profession is not an ordinary profession, but a profession that requires a certain specialization. Because, no matter how perfect the educational programs are, even if the schools have the best of the tools they need, they can only be shaped in the hands of the teacher (Güçlü & Akkaya, 2019; Pişkin & Parlar, 2021). Therefore, in the education process, teachers should receive an education that is not only based on theory but also in applications. Gürler and Tekmen (2020) stated that the knowledge gained as a result of applied training is more permanent and that individuals will feel more ready for the teaching profession with applications.

When the results obtained regarding the perceptions of the teaching profession in the media are examined, it is concluded that there is a perception that the teachers are constantly on vacation in the media, that teachers' salaries are high, that they come to the fore with violence, that teachers are seen as inadequate and that there is a perception that teacher appointments are made a lot. Today, the media has an important position in both human and social life with its power of informing and directing. The way in which the ideas about teachers are reflected in the media affects the perspective of the society towards teachers (Grandy & Mavin, 2011; Pişkin & Parlar, 2021; Reyes &Rios, 2003; Zafer & Vardarlıer, 2019). According to Doğan (2018), the image of teachers in society is shaped by how teachers are portrayed in the media and the news about

teachers. At the same time, Swetnam (1992) states that the way teachers are shown in movies and television programs affects the society's thoughts about the teaching profession. Therefore, according to the participants, it can be said that the perception of teachers in the media taking vacations all the time reduces the prestige of tteachers in the eyes of the society. Because the main duty of teachers is to provide education to students. However, teachers take a vacation at the end of the education period with the closing of schools. In addition, the fact that teachers are seen as inadequate in the programs in the media may create a negative opinion towards teachers in the society. Such a perception in the society will show the teachers as the reason for the failure in education. Because the teacher has an important role in gaining the desired behaviors and achieving success in education. Evaluation of teachers as inadequate in the media will also affect the perception of teachers in the society.

When the results obtained regarding the perspectives of different occupational groups towards the teaching profession are examined, it has been concluded that different occupational groups have the perception that teachers' salaries are insufficient, their free time is excessive, they have no difficulties, they are seen as an ordinary profession, and that everyone can teach. The definitions of teaching by different professional groups are evaluated primarily not for the profession, but according to the salary and free time they receive. The teaching profession is seen as ordinary for different professional groups and education, which is very important for society, remains in the background. Regarding this situation, Baş and Nural (2023) stated that teaching is seen as an easy job that can be done by everyone, due to the lack of an adequate criterion for the teaching profession in Turkey. Seeing teaching as an easy job damages the prestige of the profession and undermines the confidence in teaching. In addition, the social and economic status of teachers also determines their status in society. Salaries, social opportunities and working conditions of teachers are evaluated according to different occupational groups and compared with other occupations. As a result of this comparison, because the socio-economic status of teachers is not considered sufficient, it causes fewer qualified individuals to prefer the teaching profession (Pişkin & Parlar, 2021).

When the results obtained regarding the parents' perspectives towards the teaching profession are examined, it is seen that the necessary value is not given to the teachers, the teacher is seen as a baby-sitter, the teacher is responsible for student failure, the teacher is not respected, the teacher's evaluations are not taken into account, the child is above everything, and the parents know everything. It was concluded that they have a perception of ownership. In order to achieve the desired success in education, teachers should have positive relations not only with students but also with students' parents (Koç, 2020; Koşar, 2022; Özmen et al., 2016; Torun & Oruç, 2022). Because teachers get help from parents in order to get to know their students better and guide them (Banda & Mutambo, 2016). For this reason, parents' attitudes and behaviors towards teachers affect students as well as teachers' work motivation. However, today, many individuals believe that those who have knowledge and skills in a certain subject can become teachers, causing people to see teaching as an easy job (Tuğluk & Kurtmen, 2018). It can be said that this perception in the society also affects the parents and causes them not to give sufficient value to the teaching profession. Similar to this result, in the research conducted by Koç (2020), it was concluded that tough parents who are prejudiced, do not care for their children, cannot communicate, have psychological problems, insist on their mistakes and act overprotective towards their children, interfere with the professional practices of the teacher and give advice to the teacher in matters that require expertise. In addition, parents with a negative perspective can lead to a decrease in communication between teacher and parent.

When the results obtained regarding the students' perspectives towards the teaching profession are examined, it is concluded that the students do not take the teacher seriously, do not respect the teacher, do everything, have the view that teachers do not have the power of sanction, and have the perception of the school as a place to spend time. Behaviors and stereotypes that students have learned before (Basbay & Bektaş,

2010; Şahin & Ekici, 2019) can affect new learning as well as their attitudes and behaviors towards the teacher. Negative information about the teaching profession that students have learned from the media or from the social environment (Doğan, 2018; Grandy & Mavin, 2011; Pişkin & Parlar, 2021; Reyes &Rios, 2003; Zafer & Vardarlıer, 2019) may cause the teacher not to be taken seriously and not shown the necessary respect for the teacher. Since this can make it difficult for the student to learn new information, it also harms their academic success. Because the information obtained from old experiences can affect new learning positively as well as negatively (Seven & Engin, 2008). In addition, negative attitudes and behaviors that students may have towards the teacher may affect not only themselves but also the whole class. As a matter of fact, the result of İnci and Cubukçu's (2020) research that 'the students' disrespect towards the teacher also disrupts the classroom order' supports this situation. Another result obtained in the research is that teachers do not have the power to impose sanctions. The abolition of grade repetition has led students to think that they can pass the grade without studying. In the research conducted by Şan (Cited by Edis & Yılmaz, 2020), it is stated that the students would be indifferent to the lesson and the teacher due to the lack of failure in the classroom. It can be said that the teacher's not being decisive in passing the grade in case of students' failure will reduce their influence on students.

According to the results obtained in the research, suggestions such as increasing the seminars for teachers to improve themselves, improving the socio-economic status of teachers as they affect the social status of teachers, avoiding negative news and programs in the media, taking into account teacher evaluations in case of student failure, and repeating the grade if necessary can be offered.

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# The Examination of The Relationship Between Teachers' Talent Management Perceptions and their Organizational Commitment

*Research Article*

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ABSTRACT

This study was conducted to examine the relationship between teachers' talent management perceptions and their organizational commitment. The relational survey design, which is one of the quantitative research methods, was used in the study. The research was carried out with teachers working in private Anatolian high schools in Istanbul during the 2020-2021 academic year. The sample of the study consisted of 374 participants. The "Organizational Commitment Scale" and the "Teachers' Talent Management Scale" were used as data collection tools for the study. Descriptive statistics, arithmetic mean, standard deviation, Pearson correlation analysis and regression analysis, t-test, one-way ANOVA, Kruskal Wallis, Mann Whitney-U test, and other techniques were used to analyze the data. As a result of the research, a positive and strong relationship was observed between teachers' perception levels of talent management and their organizational commitment. Based on the results, various qualitative and mixed research can be conducted to investigate other factors that affect teachers' talent management perceptions and organizational commitment (such as organizational justice and job satisfaction). It is suggested that by identifying factors that increase teachers' talent management perceptions and organizational commitment, more efficient results can be obtained.



**Keywords:**
Teacher,talent, talent management, organşizational commitment.

## Introduction

Formal education progresses through schools. The necessity of education is a fundamental issue for individuals to develop and be beneficial to humanity. The foundation for progress towards targeted objectives

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is laid in schools. According to system theory, schools are living organisms. The survival and continuity of this organism depend on the health of the parts it contains and their ability to function as a whole in harmony. The main components of schools, which are a subsystem of the education system, are school administrators, teachers, students, and school staff (Bursalioglu, 2015).

Talent is the potential of certain characteristics that individuals are born with and can be developed over time with environmental conditions (Akar, 2015). The presence of talented teachers and administrators is also crucial for schools to be competitive and adapt to the developing world.

With talent management practices, teachers and administrators working in schools must develop themselves to behave in a way that is in line with the school's predetermined mission and vision. They must be able to transfer their knowledge, experience, and accumulation to each other and their environment in the most suitable way in making decisions and implementing methods.

To attract and retain the best talent in any region of the world, organizations must have a very strong and positive brand. Research indicates that activities in this regard are a significant force in talent management. Therefore, organizations must be attractive employers and create a good brand, increasing the likelihood of being chosen by talented employees. In today's world, where it is very difficult to obtain sufficient employees, it is necessary to carry out an effective talent management process, increase employees' loyalty to the institutions where they work and retain them (Davies, 2014).

In the last century, with globalization and population movements, the concept of talented employees and talent has become increasingly important for organizations to achieve sustainable competitive advantage. The increasing importance of knowledge due to the rapid developments in information and communication technologies has led to increased competition among organizations at national and international levels, and the need to acquire qualified human resources. In today's rapidly changing business environment, businesses have realized that the key factor that will enable them to adapt to innovations, be preferred among their competitors, and move their organizations ahead of their competitors in competition is to employ talented employees in their organizations (Atlı, 2017).

The discovery, acquisition, retention, development, and effective use of talented employees who perform better than their counterparts are crucial for organizations to prepare for the future, achieve competitive advantage, and reach their strategic goals. For businesses, it is important to ensure the organizational commitment of talented individuals. If a talented employee leaves the company, they will take with them the tacit knowledge they possess, and the company's competitiveness will weaken, making it more difficult to gain an advantage over its competitors. Ensuring the organizational commitment of talented employees in businesses requires the involvement of all management levels in the process.

In Turkey, there are not many studies that measure the relationship between teachers' perception of talent management and their level of organizational commitment. This research analyzes the level of perception of talent management and organizational commitment of teachers working in schools according to different variables. Obtaining the opinions of teachers working in schools on this topic is necessary for contributing to the literature. Therefore, the main purpose of this research is to determine the perception level of talent management and organizational commitment of teachers in their schools, to identify whether these levels differ according to personal variables, and to provide various recommendations based on the research findings. Therefore, the research problem can be formulated as follows: "Is there a relationship between the perception level of talent management and organizational commitment of teachers?"

**Talent Management**

Talent is defined by the Turkish Language Association as "the ability, capacity, or aptitude of a person to understand or do something," and as "the inherent power, capacity in the organism for adapting to a situation" in education science. Talent is a combination of various innate and acquired features of an individual. Although talent is innate, it can be developed through different training methods. Talent management refers to the proper processing of human resources inputs in businesses and plays a guiding role in achieving the organization's goals. If human resources management is considered a process series, talent management is one of its most important elements. Factors that have led to the emergence of talent management

Include globalization, technological developments, increasing competition, demographic factors such as generational differences and aging, changing workforce profiles, and the need for new management techniques (Çelik, 2019). The theoretical foundations that guide talent management practices have emerged from different theorists and their research in different periods. According to Akar (2015), talent management is part of the business strategy and requires a continuous talent perspective and attitude towards the company. It involves bringing the necessary talents into the company and continuously developing all employees in different departments, from top to bottom, as needed. The stages of talent management, which include making the conditions attractive, retaining talented employees in the company, and including organizational backup phases, are part of strategic planning. After making the necessary planning, bringing talented employees into the company and starting to work with the right candidates is one of the first steps that must be taken for the sustainability of the company. The recruitment function in talent management is similar to the marketing function. Therefore, the recruitment manager should think and act like a marketing manager. They must find the right candidate, offer them the right proposals, and at the same time, highlight their different aspects, in a way, investing in themselves. Being in the same environment with talented employees is also of great importance in educational organizations. High levels of education for individuals and societies are essential for future generations, as stated by Günbey (2016).

**The Concept of Talent Management in Educational Organizations**

The evaluation of talent management in educational organizations relies primarily on directing educators with leadership qualities, especially school principals and vice principals. In order for schools to grow and develop, teachers, as well as school principals and vice principals, should be subjected to different trainings and be equipped with innovative approaches. According to Korumaz and Tabancalı (2014), in order to face and compete with the existing competitive structure in the globalizing world and reach the best, educational leaders in leadership positions should be continuous learners and role models for teachers.

According to Bursalıoğlu (2015), the elements present in school management are divided into two categories: internal and external. Internal elements include school administrators, students, teachers, non-educational staff, and civil servants. External elements consist of factors that indirectly affect the school, such as pressure groups, families, and the job market.

Administrators are individuals who have undertaken the responsibility of keeping the school alive according to its objectives. In doing so, they should be able to apply new and different management styles, that is, they are expected to have a flexible structure that can adapt to any kind of change or unexpected situation that may arise. While the school principal operates the management process, they should have a personality structure that can make correct and appropriate decisions, and be able to serve as a role model for both students and teachers as well as other colleagues.

Decision-making is at the heart of management, and after the decision-making step, the planning, organizing, communication, influencing, coordination, and evaluation steps follow in the management

process. The management process is formed by the intermingling of these steps. While fulfilling the mission of keeping the school alive, the educational administrator takes a leadership position. Similarly, teachers are the most important individuals in terms of the success of students, and therefore they should be qualified, high-performing, and talented individuals.

Since the input and output of the system in educational organizations is human, they differ greatly from other financial institutions. According to Wasilowski (2012), educational institutions have a different functioning compared to many firms in the industry. In particular, increasing the talented workforce in educational institutions and ensuring the continuity of qualified staff being hired is critical for competitiveness. According to Blass (2009), talent management is at the very center of the steps of hiring, retaining, and developing personnel within the framework of strategy, planning, and human resources management.

**The Relationship between Talent Management and Organizational Commitment**

Studies have shown that there is a significant and meaningful relationship between talent management and organizational commitment (Aytaç, 2015). Successful talent management practices are closely related to positive outcomes such as organizational commitment. Research has demonstrated that effective talent management practices increase employees' level of job integration and also enhance their organizational commitment. It has been noted that employees with high job characteristics also have high levels of job integration (Saks, 2006:604, citing Kahn, 1992).

The purpose of this research is to determine the relationship between teachers' perception of talent management and their organizational commitment. In this context, answers to the following research questions were sought.

What is the teachers' perception level of talent management?

What is the organizational commitment level of teachers?

3- Teachers' views on perceptions of talent management and the level of their organizational commitment;

a) Gender,

b) Branch,

c) Educational status,

d) Age,

e) Does it show a significant difference according to the variables of seniority?

4- Is there a significant relationship between teachers' perception levels of talent management and their organizational commitment?

## Method

In this research, quantitative methods were used, and the data were collected and analyzed by collecting quantitative data. Since the aim was to examine the relationship between teachers' talent management perceptions and organizational commitment, a descriptive study in a relational survey design was carried out. The population of this study consisted of 12,089 teachers working in private Anatolian high schools in Istanbul during the 2020-2021 academic year. The numbers of schools and teachers working in them in the study population were determined using data obtained from the Istanbul Provincial Directorate of National Education Strategy Development Department Statistics (2020).

The sample of the study was determined by using a simple random sampling method. The required sample size was found to be 374. Cochran's formula (1966; cited in Balcı, 2015) was used to calculate the sample size.

Validity and reliability measurements used in the literature were conducted at the beginning of the study, and scales were reviewed. As a result of the examination, the "Teachers' Talent Management Scale" and the "Organizational Commitment Scale" were found suitable for use to determine teachers' talent management perceptions. The Teachers' Talent Management Scale developed by Demirkasımoğlu (2015). The Teachers' Talent Management Scale consisted of a total of 43 items, consisting of the sub-dimensions "job attraction," "job selection," "talent development," and "talent retention." It is a valid and reliable scale. The Cronbach-alpha coefficient is .960 for the whole scale; .900 for the job attraction sub-dimension, .860 for the job selection sub-dimension, .920 for the talent development sub-dimension, and .910 for the talent retention sub-dimension.

The second scale is the The Organizational Commitment Scale developed by Meyer, Allen and Smith (1993). The Organizational Commitment Scale consisted of a total of 18 items and is also a valid and reliable scale. The scale was adapted into Turkish by Dağlı, Elçiçek and Han in 2018. The Cronbach-alpha coefficient is .880 for the whole scale; .800 for the emotional commitment sub-dimension, .730 for the continuance commitment sub-dimension, and .800 for the normative commitment sub-dimension. The results of the reliability studies, including the Chronbach-Alpha and item-total correlation values, exceeded the expected values, indicating that the scale is a reliable measurement tool (Dağlı, Elçiçek, Han, 2018). Personal information forms prepared by the researcher included demographic information on variables such as age, gender, education level, subject, and professional seniority that could affect the research results.

Data collection tools for teachers working in private Anatolian high schools in Istanbul were prepared via Google forms due to the continuing impact of the pandemic during the research process. School administrators were informed via email and phone beforehand, and after obtaining their permission, these forms were sent to schools via email. When face-to-face education began, the scales and information forms were distributed to schools by the researcher to reach the required number of participants. A total of 374 participants returned the forms out of the 3,000 forms sent to teachers in the study population of 12,089.

The data of the research were analyzed using the SPSS 26 package program. The data related to the scales were transferred from the excel environment to the SPSS program. Frequency and percentage values regarding demographic characteristics were calculated. Descriptive statistics were calculated for the scales and the relationship between the scales and demographic characteristics was analyzed using independent samples t-test, one-way ANOVA, and Pearson correlation tests.

This study is based on the relational scanning model and focuses on the existence of this relationship. As the number and quality of skills that employees acquire increase, the organization's ability to compete will also strengthen. However, it will become more difficult for the organization to retain talented intellectual capital to maintain its competitive advantage. To retain talented employees within the organization, which is essential for the organization to achieve a competitive advantage through quality human resources, the reasons for their organizational commitment should be carefully analyzed, and appropriate practices should be developed.

Organizations that implement talent management practices by selecting individuals with the required skills for the job will increase the level of organizational commitment among those who feel talented in their jobs and decrease their intention to leave. Individuals who are invested in and trained in their talents will enhance the organization's performance, intellectual capital, and competitiveness by staying with the organization. When employees feel competent in their jobs, they develop a sense of commitment to the organization, providing them with sufficient job satisfaction as members of the organization. Strong

emotional attachment will enable individuals to stay with the organization and accept its goals and values.

**Table 1.** Skewness and Kurtosis value

| | | **Statistics** |
|---|---|---|
| Talent Management | Skewness | -,061 |
| | Kurtosis | -,798 |
| Recruitment | Skewness | -,284 |
| | Kurtosis | ,271 |
| Selection | Skewness | -,667 |
| | Kurtosis | -,195 |
| Development | Skewness | -,291 |
| | Kurtosis | -,827 |
| Retention | Skewness | ,298 |
| | Kurtosis | -,868 |
| Organizational Commitment | Skewness | -,283 |
| | Kurtosis | ,858 |
| Emotional Commitment | Skewness | ,351 |
| | Kurtosis | 2,495 |
| Continuance Commitment | Skewness | -,244 |
| | Kurtosis | -,284 |
| Normative Commitment | Skewness | -,381 |
| | Kurtosis | -,152 |

Skewness (asymmetry) and kurtosis (peakedness) values were examined to determine if the data collected from the scales had a normal distribution. When skewness and kurtosis values are between -2 and +2, the data is considered to have a normal distribution (George and Mallery, 2010). Therefore, it was assumed that all dimensions of the "Teacher Talent Management Scale" except for the "Emotional Commitment" subscale and all dimensions of the "Organizational Commitment Scale" were normally distributed.

In the interpretation of the mean scores obtained, the five-point rating scale used in the survey was considered. For the "Teacher Talent Management Scale," scores between 1.00-1.80 were interpreted as "strongly disagree," scores between 1.81-2.60 as "disagree," scores between 2.61-3.40 as "somewhat agree," scores between 3.41-4.20 as "agree," and scores between 4.21-5.00 as "strongly agree." For the "Organizational Commitment Scale," scores between 1.00-1.80 were interpreted as "definitely disagree," scores between 1.81-2.60 as "disagree," scores between 2.61-3.40 as "undecided," scores between 3.41-4.20 as "agree," and scores between 4.21-5.00 as "strongly agree."

## Findings

**Table 2.** Descriptive Statistics Results for Teacher Talent Management Sub-Dimensions

| | **n** | $\underline{X}$ | **s** |
|---|---|---|---|
| Recruitment Sub-dimension | 374 | 3,28 | 1,26 |
| Selection Sub- dimension | 374 | 3,61 | 1,19 |
| Development Sub- dimension | 374 | 3,51 | 1,26 |
| Retention Sub- dimension | 374 | 2,93 | 1,39 |

As seen in Table 1, when the expression is examined in terms of upper and lower limits of the arithmetic mean, it can be observed that the average of the sub-dimensions of talent management, namely recruitment

(=3.61) and talent development (=3.51), is high, while the average of the sub-dimensions of recruitment (=3.28) and talent retention (=2.93) is at a moderate level among the participating teachers in the research.

It can be said that the high averages of the recruitment and talent development sub-dimensions result from the teachers' satisfaction with the practices in their schools and their belief that they are recruited fairly and objectively. It can be concluded that the teachers are selected based on their talents and that their job descriptions are clearly defined during the recruitment process. Additionally, it can be inferred that special development plans are made for teachers and that administrators provide support to help teachers perform their jobs better.

The moderate average of the sub-dimensions of recruitment and talent retention indicates uncertainty regarding the belief that good teachers are attracted to the institution, the dissatisfaction of teachers with the salaries they are paid, and the indecisiveness about whether performance-based reward systems, appreciation, salary increases, etc. are satisfactory enough. It can also be interpreted that there are teachers who are neutral about whether new regulations have been implemented.

**Table 3.** Descriptive Statistics of Organizational Commitment Sub- Dimensions

| | n | $\underline{X}$ | S |
|---|---|---|---|
| Emotional Commitment S.D. | 374 | 3,04 | 1,27 |
| Continuance Commitment S.D. | 374 | 3,42 | 1,32 |
| Normative Commitment Sub.B. | 374 | 3,34 | 1,35 |

In Table 2, the descriptive statistics of the sub-dimensions of organizational commitment are presented. The emotional commitment sub-dimension has a sample size of 374, with a mean (X) of 3.04 and a standard deviation (S) of 1.27. The continuance commitment sub-dimension also has a sample size of 374, with a higher mean (X) of 3.42 and a standard deviation (S) of 1.32. The normative commitment sub-dimension has the same sample size of 374, with a mean (X) of 3.34 and a standard deviation (S) of 1.35.

The high mean for the Continuance Commitment sub-dimension suggests that teachers believe they may experience various difficulties due to economic conditions if they were to lose their jobs. Due to the existing unemployment and lack of alternative options, they believe that finding another job will be challenging, which is why they may not want to leave their current institutions.

The medium mean for the Emotional and Normative Commitment sub-dimensions suggests that some teachers see their institutions as their own families, while others do not feel a strong sense of belonging towards them. Some teachers may believe that their schools hold a special place in their hearts, while others do not feel that way and do not consider themselves a part of that family.

**Table 4.** t- Test Results of Talent Management and Sub- Dimension Levels of Teachers with Gender Variable

| | | **n** | $\overline{X}$ | **s** | **t** | **df** | **p** |
|---|---|---|---|---|---|---|---|
| Talent Management | Female | 255 | 3,22 | ,83 | -2,368 | 372 | ,018 |
| | Male | 119 | 3,43 | ,71 | | | |
| Recruitment | Female | 255 | 3,23 | ,42 | -2,968 | 372 | ,003 |
| | Male | 119 | 3,37 | ,41 | | | |
| Selection | Female | 255 | 3,56 | ,76 | -1,581 | 372 | ,115 |
| | Male | 119 | 3,69 | ,70 | | | |
| Development of Talent | Kadın | 255 | 3,42 | 1,09 | -2,069 | 372 | ,039 |
| | Erkek | 119 | 3,66 | ,97 | | | |
| Retention of Talent | Kadın | 255 | 2,84 | 1,12 | -2,187 | 372 | ,029 |
| | Erkek | 119 | 3,10 | ,99 | | | |

As seen in Table 3, there is a significant difference between the perception levels of talent management and gender of teachers [t(372)=2.368, p<.05] (p=.018). According to these results, male teachers' perception levels of talent management are higher than female teachers. In other words, male teachers have higher perceptions of talent management than female teachers.

There is also a significant difference between the gender of teachers and their perception levels of recruitment [t(372)=2.968, p<.05] (p=.003). According to these results, male teachers' perception levels of recruitment are higher than female teachers. In other words, male teachers have higher perceptions of recruitment than female teachers.

However, there is no significant difference between the gender of teachers and their perception levels of selection [t(372)=1.581, p>.05] (p=.115). In other words, the perception levels of selection among teachers do not vary according to gender.

There is a significant difference between the gender of teachers and their perception levels of talent development [t(372)=2.069, p<.05] (p=.039). According to these results, male teachers' perception levels of talent development are higher than female teachers. In other words, male teachers have higher perceptions of talent development than female teachers.

Finally, there is a significant difference between the gender of teachers and their perception levels of talent retention [t(372)=2.187, p<.05] (p=.029). According to these results, male teachers' perception levels of talent retention are higher than female teachers. In other words, male teachers have higher perceptions of talent retention than female teachers.

Some studies on talent management based on gender have shown that gender does not create any differences in talent management (Özer, 2017; Hafez et al., 2017).

**Table 5.** Descriptive Statistics and ANOVA Results for the Level of Talent Management and its sub- Dimensions, and the Variable of Seniority

| | | **n** | $\underline{X}$ | **s** | **p** | |
|---|---|---|---|---|---|---|
| Talent Management | 1-5 years | 100 | 3,32 | ,85 | ,294 | p>,05 |
| | 6-10 years | 86 | 3,30 | ,89 | | |
| | 11-15 years | 76 | 3,40 | ,72 | | |
| | 16+ years | 112 | 3,18 | ,72 | | |
| Recruitment | 1-5 years | 100 | 3,29 | ,40 | ,169 | p>,05 |
| | 6-10 years | 86 | 3,19 | ,44 | | |
| | 11-15 years | 76 | 3,32 | ,44 | | |
| | 16+ years | 112 | 3,31 | ,41 | | |
| Selection | 1-5 years | 100 | 3,59 | ,77 | ,264 | p>,05 |
| | 6-10 years | 86 | 3,57 | ,86 | | |
| | 11-15 years | 76 | 3,75 | ,66 | | |
| | 16+ years | 112 | 3,54 | ,67 | | |
| Talent Development | 1-5 years | 100 | 3,40 | 1,15 | ,444 | p>,05 |
| | 6-10 yeras | 86 | 3,54 | 1,13 | | |
| | 11-15 yeras | 76 | 3,65 | ,99 | | |
| | 16+ years | 112 | 3,45 | ,97 | | |
| Talent Retention | 1-5 years | 100 | 3,10 | 1,10 | ,013 | P<,05 |
| | 6-10 years | 86 | 2,98 | 1,19 | | |
| | 11-15 years | 76 | 3,02 | 1,03 | | |
| | 16+ years | 112 | 2,65 | ,99 | | |

According to Table 4, there is a significant difference between teachers' seniority and their perception scores on retaining talent [F(3,370)=,013, p<.05]. According to this result, it can be seen that those in the 1-5 years of seniority group (X̄=3.10) have more positive thoughts compared to other categories.

**Table 6.** Correlation Results between Organizational Commitment Scale and Sub- Dimensions of Teacher Talent Management Scale (n=374)

| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **9** | |
|---|---|---|---|---|---|---|---|---|---|
| Talent Management | 1 | | | | | | | | |
| Recruitment | ,630** | 1 | | | | | | | |
| Selection | ,848** | ,545** | 1 | | | | | | |
| Talent Development | ,948** | ,588** | ,790** | 1 | | | | | |
| Retention | ,926** | ,455** | ,687** | ,796** | 1 | | | | |
| Organızatıonal Commıtment | ,661** | ,416** | ,608** | ,629** | ,591** | 1 | | | |
| Emotional Commitmen | ,278** | ,250** | ,293** | ,264** | ,217** | ,656** | 1 | | |
| Continuance Commitmen | ,640** | ,364** | ,569** | ,608** | ,591** | ,877** | ,374** | 1 | |
| Normative Commitmen | ,617** | ,371** | ,560** | ,590** | ,557** | ,851** | ,333** | ,652** | 1 |

When the correlation coefficient is found to be negative, there is a reverse relationship between the two variables, meaning that "as one variable increases, the other decreases" is stated. When the correlation coefficient is positive, it is interpreted as "as one variable increases, the other also increases." The interpretation of the correlation coefficient (r) is as follows: if r < 0.2, there is a very weak relationship or no correlation, between 0.2-0.4 there is a weak correlation, between 0.4-0.6 there is a moderate correlation, between 0.6-0.8 there is a high correlation and if 0.8> then it is interpreted as a very high correlation.

As seen in Table 5, when the correlation results of the Organizational Commitment Scale and the Teacher Talent Management Scale and their sub-dimensions were examined after the application, it was observed that there is a positive relationship in all dimensions. A high correlation (r=0.661) was found between the Organizational Commitment Scale and its sub-dimensions and the Teacher Talent Management Scale and its sub-dimensions.

It was observed that there was a moderate correlation between organizational commitment and the recruitment sub-dimension (r=0.416), a high correlation between the selection sub-dimension (r=0.608), a high correlation between the talent development sub-dimension (r=0.629), and a moderate correlation between the talent retention sub-dimension (r=0.591).

A weak correlation was found between talent management and emotional commitment sub-dimension (r=0.278), a high correlation with continuance commitment sub-dimension (r=0.640), and a high correlation with normative commitment sub-dimension (r=0.617).

## Results

This study was designed to investigate the relationship between talent management and organizational commitment. To summarize the research findings, in this study, teachers' perception levels of talent management were found to be moderate in the sub-dimensions of talent attraction and retention, and high in the sub-dimensions of job selection and talent development. Teachers' organizational commitment levels were found to be moderate in the sub-dimensions of affective commitment and normative commitment, and high in the sub-dimension of continuance commitment. In addition, most of the demographic variables do not have a differentiating effect. As an exception, teachers' perception levels of talent management vary according to gender. Male teachers' perception levels of talent management are higher than female teachers, except for the job selection sub-dimension. Cultural contexts may differ in terms of the importance and roles attributed to male and female identities. In this sense, it can be said that some cultural contexts contain limiting factors for women. In addition, some biographical variables may also have an impact on individuals' talent capital and perceptions (Böhmer, Schinnenburg, 2016). Accordingly, the gender differentiation in the perception of talent management may be due to cultural context or biographical differences. Another differentiating effect is between seniority and talent management variables. Teachers' perception levels of talent management vary according to seniority. Only the perception levels of teachers with 1-5 years of seniority are higher than others in the talent retention sub-dimension. According to the results of this research, organizational commitment does not differ according to demographic variables. In the literature, studies dealing with teachers' organizational commitment in terms of demographic variables reveal different results. For example, Gülova and Demirsoy (2012) investigated the relationship between organizational culture and organizational commitment. The results of the research vary according to the variables of gender, educational status and seniority.

It is very important to examine the relationship between organizational commitment and talent management in terms of the development of educational organizations (Aytaç, 2015). This is because, talent management strategies create multidimensional correlations in terms of organizational and individual well-being (Dayeh, Farmanesh, 2020; Malkawi, 2017). Similarly, organizational commitment facilitates positive organizational behaviors. Organizational commitment is significantly related to working conditions. Mismanagement of human resources causes organizational stakeholders to experience psychological and behavioral indifference. In the resulting negative organizational atmosphere, motivation and performance decrease. Organizational commitment is an important factor to overcome these negativities (Colquıtt, Lepıne, Wesson, 2019). In this sense, the most important finding of the research is the nature of the relationship between these variables. According to the correlation results of organizational commitment and teachers' talent management and all sub-dimensions; all dimensions are positively correlated. If teachers perceive that they are seen as a talent in the school organization, greater commitment is obtained (Björkman, Ehrnrooth, Mäkelä, Smale, Sumelius, 2013). As the findings confirm, effective talent management practices attach importance to competent individuals and gain their commitment (Collings, Mellahi, 2009). Perceived administrative support, recognition and appreciation reinforce positive feelings. Moreover, the perception of organizational justice of individuals who perceive that their potential is supported is reinforced. These factors are important sources of organizational commitment (Goestjahjanti, Novitasari, Hutagalung, Asbari, Supono, 2020). Research on the relationship between talent management and organizational commitment has revealed a positive and significant relationship between the two (Nobarieidishe et al., 2014; Kheirkhah et al., 2016; Malkawi, 2017; Köprülü and Çetinsöz, 2019; Tarakçı and Öneren, 2018; Alparslan and Saner, 2020; Dayeh and Farmanesh, 2021). In this sense, the findings of this study are consistent with previous research results. Altun and Vural (2012) examined the effect of talent management, which is compatible with performance evaluation systems, on organizational commitment, and determined that the commitment of employees was positively affected at the end of the research. Investigating organizational commitment is very important in terms of

organizational goals. According to Ergün and Çelik (2019), organizational commitment enables individuals' orientation towards organizational goals and increases organizational effectiveness. In addition to organizational benefit, considering the relationship between talent management strategies and organizational commitment is also important in terms of teacher motivation (Luna-Arocas, Valle, Lara, 2020).

Teachers are the most important school resources for improving educational outcomes. One of the critical tasks of school principals is to believe and value the talents of teachers. Creating a school culture accordingly encourages teachers to reveal and improve their talents (Aung, Sett, Htang, 2021). Future research can investigate the effects of talent management practices and organizational commitment variables on student achievement. Increasing effectiveness by developing positive organizational behaviors has strategic importance for school management. This is because, the appreciation of teachers' abilities and the increase of their commitment produce benefits in terms of organizational, social and individual aspects.

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# Examining The Effect Of Differentiatied Education Training Applied To Social Studies Teachers On Their Self-Efficacy And Activity Designing Skills[123]

*Research Article*

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ABSTRACT

This study aims to determine the effect of differentiated education training applied to social studies teachers on increasing self-sufficiency, and developing differentiated activity preparation skills. The research used convergent parallel mixed method design. The participants consist of 26 teachers, 13 for the experimental group and 13 for the control group. After the pre-tests which were conducted in the study, firstly a 5-day theoretical differentiated education training was conducted with the teachers in the experimental group, and then the differentiated activities prepared by the researcher were applied to the GT and potential GT students in the classrooms for two months, under the guidance of the researcher. Meanwhile, mentor support was provided for the teachers. In the second teacher training, the applications made with the teachers who personally experienced the application process of the differentiated activities were evaluated and the training of developing differentiated training activities with teachers continued. At the end of the applied training, the differentiated activities prepared by the teachers were applied in the classrooms for two more months. At the end of this whole process, post-tests were applied and teachers' opinions about the application were taken. As a result of the research, training applied within the framework of the applied differentiation education results in that their perceptions of self-sufficiency increased significantly, and the teachers' ability to prepare activities improved. As a result of the study, the teachers stated that the teacher training provided is beneficial for the education of the GT students, and that it is beneficial to have extended, applied and mentor-supported training process.



**Keywords:**
Differentiation, Teacher Education, Talented

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## Introduction

Despite the fact that all students are different from each other, all subjects are taught to all students at the same pace and with the same methods (Sak, 2017; Tomlinson, 1999). Standardized education practices can sometimes result in failure. Danış (2021) states that one of the main objectives of educational institutions is to raise individuals who can think multi-dimensionally and have high mental potential. According to Renzulli (2012: 58), how the education of gifted students will differ from general education will be decisive in raising leaders of the 21st century.

Differentiated instruction is prepared in accordance with the individual differences of the students. Differentiated instruction includes the following factors; students can take tasks according to their characteristics, teachers can group students flexibly, it includes an evaluation process which covers the entire process, flexible adaptations can be made, and teachers can make changes in the process, content and product by taking students' readiness, interest and learning processes into consideration (Tomlinson, 1999). In differentiated instruction, educators can differentiate content, process, product, assessment and learning environment according to student characteristics (Avcı and Yüksel, 2016; Demir, 2013; Tomlinson, 1999). According to Tomlinson (1999), each student differs in terms of interest, intelligence, language, culture, experience, readiness, gender and learning styles. This makes it necessary to differentiate the instruction process. Since students are not capable of differentiating the instructional process on their own and in the right way, it is the teacher's job to differentiate it. In differentiated classrooms, student needs and learning styles are taken into account and education is organized according to student differences.

when differentiation practices are carried out in the classroom, one or more of the components of content, teaching process, product, emotions and learning environment can be differentiated. Content is the knowledge and skills that the teachers aim to teach to their students during the teaching process and all the materials or mechanisms they use to teach them (Atalay, 2014; Tomlinson, 1999). The teaching process is how teaching is carried out. They are activities designed to understand students' basic knowledge and skills so that students can use core skills (Avcı and Yüksel, 2016; Tomlinson, 1999). All the tools that students use and display while learning are called products (Tomlinson, 1999: 25). The learning environment can be differentiated in terms of space, time, or materials. While doing this, it is essential to provide an environment in which students can actively participate in all learning activities (Avcı and Yüksel, 2016).

The most accepted teacher training models are the humanistic theory-based teacher training model, model-centered teacher training model, reflection model and constructivist theory-based teacher training model. The most prominent teacher training models in practice are the applied science model, the skills model and the reflection model (Ekiz and Yiğit, 2006). The fact that gifted students are more emotional than other students causes them to be more influenced by their teachers. Therefore, it is very important to train teachers of gifted students in this field (Sak, 2017: 363). In order to ensure the healthy social, academic and cognitive development of gifted students, who differ from their peers in terms of learning, social and emotional needs, teachers should have more professional competencies and different personality traits compared to typical teachers (Ford and Trotman, 2001; Sak, 2017). In the standards determined by the National Association for Gifted Children, and Council for Exceptional Children The Association for the Gifted (NAGC-CEC) (2013), regarding the training of gifted students' teachers, it was stated as the first standard that teachers who will be involved in the teaching of gifted students should have the understanding that each individual has different characteristics in terms of learning and development, and that they should put this understanding into practice and create a meaningful and productive learning experience for gifted students.

Self-efficacy can be defined as "a person's belief in his abilities to realize the situations expected of him". A strong sense of self-efficacy enables individuals to show more commitment to these goals (Bandura, 1997).

The social studies course is a course designed to raise democratic, active citizens who combine knowledge related to the social dimension of life on the basis of an interdisciplinary approach (Doğanay, 2002: 43). Teaching social studies to gifted individuals is of great importance in the future of societies. Because the inventors and leaders of the future will likely emerge among these individuals (Renzulli, 1988: 301). The social studies course, which has a very important role in terms of perceiving the world, perceiving the society and culture in which they live, and creating a sense of belonging to the society, is also very important for gifted students and their education. Gifted students need enriched educational environments and differentiated instruction (Çengel and Alkan, 2018; Renzulli and Renzulli, 2010). In the Social Studies teachers' special field competencies determined by MoNE, it is stated that activities should be adapted for students who need special education and learning environments should be enriched (MEB, 2017). Differentiated social studies teaching practices suitable for gifted students are not sufficient (Uzun, 2022). It is stated in the literature that teachers may be inadequate in preparing curricula, lesson plans and differentiated classroom practices for gifted students (Baykoç and Özdemir, 2016; Demirkaya, 2018; Erdoğan, 2017; Little et al., 2007). There are many studies showing that the implementation of differentiated activities in formal education is limited (Machu and Malek, 2015; Öztürk and Mutlu, 2017; VanTassel-Baska et al., 2021). On the other hand, there are studies showing that teacher training contributes to differentiated instruction practices (Altıntaş, 2014; Kaplan Sayı, 2013; Little et al., 2007). Therefore, the need to train teachers on differentiated instruction comes to the fore.

There are studies in the literature that reveal that teachers are inadequate in preparing and implementing differentiated activities and that their self-efficacy is low because they feel this inadequacy (Baykoç and Özdemir, 2016; Öztürk and Mutlu, 2017). There are studies showing that teachers who do not consider themselves competent in differentiated instruction are less likely to use differentiated activities in their classrooms or do not use differentiated activities at all (Ekinci, 2002; Suprayogi et al., 2017). This study is important in terms of revealing that the teacher training program implemented with this study has a positive effect on increasing teachers' self-efficacy.

In line with the above-mentioned problems, this study aimed to examine the effects of differentiated instruction teacher training program on teachers' self-efficacy and their skills in preparing differentiated activities for gifted individuals. This study is important in terms of determining the status of social studies teachers' self-efficacy and preparing and implementing differentiated activities after a teacher training program on differentiated instruction and it is also important in terms of presenting a system to overcome the existing deficiencies. In this study, Social Studies teachers were trained by taking into consideration the characteristics of gifted individuals. The study was designed with the hope that the results of this training would help to overcome a serious deficiency in the Social Studies branch in Türkiye.

## Methodology

### Research Design

This study was conducted through mixed design in which quantitative and qualitative research designs were used together (Balcı, 2015). This study used a convergent parallel mixed design in which quantitative and qualitative data were collected and analyzed separately. In this design, the analysis of the data is given separately in the conclusion section. The data is usually combined in the discussion section. Sometimes these combinations can also be made in the conclusion section (Creswell, 2021: 98). This design was chosen because both quantitative and qualitative data will be collected simultaneously and combined and interpreted later. The study used a pre-test – post-test control group experimental design. Among scientific research, experimental research is the one in which the most precise results are obtained (Büyüköztürk et al., 2014). Self-Efficacy Scale for Gifted Education (SEES) was implemented as a quantitative data collection tool in the experimental and control groups. The teachers' progress in the activity preparation skills, which cannot be obtained with quantitative data, was examined by document analysis, a qualitative method. Qualitative

research is research in which qualitative data collection methods such as observation, interview and document analysis are used and a qualitative process is followed to reveal perceptions and events realistically and holistically in a natural environment (Yıldırım & Şimşek, 2008: 39). To collect qualitative data, pre- and post-implementation activity plans were collected from the teachers and evaluated by the researchers. Teachers in the experimental group received mentor-supported teacher training on differentiated instruction. To make the data better understandable, all these quantitative and qualitative data were combined and interpreted in the conclusion and discussion sections.

**Study Group**

Due to the necessity of having gifted individuals in the classrooms of the teachers who will participate in the study, purposive sampling method, one of the non-random sampling methods, was used in sample selection. Purposive sampling is preferred by researchers when they want to study special cases with certain qualities and criteria (Büyüköztürk et al., 2014: 90). While selecting the sample, schools, where gifted students attend, were identified. In these schools, the teachers who teach Social Studies courses to gifted students were identified and 30 teachers were selected randomly. Four teachers didn't want to participate in the study. After the pre-test was conducted on the remaining 26 teachers, two equivalent groups, consisting of 13 teachers in experimental and control groups, were determined randomly.

**Table 1.** Demographic Data about Participants

| Groups | Female | Male | Total |
|---|---|---|---|
| Experimental Group | 7 | 6 | 13 |
| Control Group | 8 | 5 | 13 |

Table 2 shows the data on the equivalence of the experimental and control groups

**Table 2.** The data on the equivalence of the experimental and control groups

| | Grup | N | Sıralar Ort. | Sıralar Top. | Mann-Whitney U | Z | p |
|---|---|---|---|---|---|---|---|
| Self-Efficacy Scale for Gifted | Experimental | 13 | 13,35 | 173,50 | 82,500 | -0,103 | 0,918 |
| Education pre-test | Control | 13 | 13,65 | 177,50 | | | |

In order to ensure the equivalence of the study groups, a pre-test was conducted on teachers. After examining the data, it was found that the data do not meet the normal distribution criteria. Therefore, Mann Whitney-U, a non-parametric test, was used to analyze the pre-test results. As seen in Table 2, the self-efficacy of the teachers for gifted education pre-test results show no significant difference between the groups (Z=0,103 and P=0,918, P>0,05).

**Experimental Process**

**Developing teacher training program.** In this study, while developing the teacher training program, first of all, existing curriculum development models were examined. The training program was developed using the model suggested by Ralph Tyler. In this study, firstly, a literature review was conducted to determine the general objectives. Existing training models and practices were examined and general objectives were determined. Then, the objectives were determined by taking expert opinions. After determining the objectives, teaching tools and learning experiences were prepared according to these objectives, and the guidance which will be provided to teachers was planned. Finally, the evaluation processes planned to be carried out at the end of the program were planned.

A pre-implementation was conducted regarding the effectiveness of the prepared teacher training program. After the teacher training program was prepared, a one-day, 6-hour pre-implementation was

conducted with four social studies teachers, one of whom was working at Science and Art Center (SAC). The teachers who participated in the pre-implementation stated that the training practices were comprehensible and instructive, that the materials presented to them during the training were sufficient, and that the presentations could have been simpler. After the pre-implementation, necessary changes were made taking into account the feedback received from the teachers and the program was finalized after taking expert opinion.

***Implementation Process.*** The implementation process is carried out in the following stages

1. Pre-tests were given to the participant teachers. In order to determine the change in teachers' ability to prepare activities for gifted students, they were asked to prepare an activity plan for one of the objectives stated in the Social sciences curriculum production, distribution, consumption and active citizenship learning area.
2. Providing 30 hours of differentiated activity planning/preparation and implementation training for the teachers in the experimental group.

   The content of the training;

   a) The basic philosophy of education: In this section, the basic educational strategies (grouping, acceleration, enrichment, coaching) related to the education of gifted students were taught.

   b) Training was provided on the characteristics of gifted individuals, their educational needs, teaching learning strategies to gifted students, how to integrate higher-order thinking skills while differentiating, and teaching strategies used in the education of gifted students.

   c) What is differentiated instruction? The theoretical foundations of differentiated instruction were explained with examples.

   d) Training on differentiated instruction preparation: Practical training was provided to teachers on the steps to be followed when differentiating the instruction.

   e) Differentiated activity preparation training: How to prepare activities in accordance with differentiated instruction was demonstrated in practice.

   f) Assessment of gifted students; It was emphasized that the assessment of gifted students should not only be done through exams but also throughout the whole education process, measurement should be diversified, and differentiations should also be made in the assessment process.

3. Implementation of the activities prepared by the researcher in the classrooms while the activity preparation training process continued for two months.

In order for the teachers to better understand differentiated instruction, differentiated activities prepared by the researchers were implemented by the teachers for the first two months. These activities were implemented both to gifted students and to the students who were considered by their teachers to be able to do these activities as well as the gifted students in the class but weren't identified as gifted. In this study, these students were referred to as potentially gifted.

4. Giving 18 hours of second differentiated activity preparation training to the experimental group teachers.

   a) Problems encountered: Teachers expressed the problems they experienced during the implementation of differentiated activities

   b) In the second teacher training held at the activity development stage, the problems experienced during the implementation of the activities prepared by the participants to the students were addressed and evaluations were made on whether these problems were experienced in other

teachers' classrooms and if so, how to solve them. Activity development training was carried out again under the guidance of the researcher.

5. The objectives given to the teachers at the beginning of the study to determine their ability to prepare differentiated activities were given again and they were asked to prepare differentiated activities related to the same objective again.
6. Implementation of the activities prepared by the experimental group teachers in the classrooms and at home during the distance education process.
7. Conducting post-tests to the teachers.
8. Conducting interviews with the teachers in the experimental group.

**Data Collection Tools and Data Analysis**

When the quantitative data obtained in this study were analyzed, it was found that the skewness and kurtosis values of the Self-Efficacy Scale for Gifted Education in the experimental group were 1.779 and 4.209 respectively, and the skewness and kurtosis values in the control group were -0.103 and -0.699 respectively. These values were outside the (+,-) 0.25 range. Based on these data, Mann-Whitney-U test, one of the nonparametric correlational statistical tests, was used to analyze the data. To calculate the effect size Pearson's correlation coefficient, r, was used. R value takes a value between 0 and 1. 0 (zero) indicates no effect, 1 (one) indicates a perfect effect. r= 0.10-0.30 indicates a small effect, r= 0.30-0.50 indicates a medium effect, r= 0.5 and above indicates a large effect. The effect size is calculated with the formula $r= Z/ \sqrt{n}$ (Cevahir, 2020: 42).

Qualitative data were analyzed using document analysis.

**Self-Efficacy Scale for Gifted Education (SESFGE)** The scale was developed by Tortop (2014). This scale was used to determine the teachers' self-efficacy regarding the education of gifted students. The scale was conducted on 56 female and 38 male teachers working in SACs. SESFGE consists of 26 five-point Likert-type items. Cronbach's alpha internal consistency coefficient of the scale is 0.90. The internal consistency coefficients for each subscale are 0.86, 0.93, 0.77, 0.77, 0.91, 0.94 and 0.94 respectively. Correlation analyses revealed that all subscales were highly correlated (Tortop, 2014: 76).

**Evaluation Form for Teacher Activities with Criteria Used in Document Analysis** The researcher gave one of the fifth-grade social studies course objectives to the teachers and asked them to plan an activity to teach it. At the end of the training, each teacher was asked to prepare a plan for the same objective. These plans were analyzed using document analysis. In order to guide the analysis of the activities prepared by the teachers, a teacher activity evaluation form was prepared by the researcher on the basis of the Curriculum for Gifted Students and MAKER by taking the expert opinions. In the study, 16 basic criteria were determined, including the differentiation of objectives, studying towards learning knowledge, the lives of distinguished people, interviews with field experts, activities involving abstractness and complexity, establishing a relationship with real life, higher-order thinking skills such as critical thinking, problem solving, decision making, creative thinking and guiding to use learning strategies, directing to scientific research, producing products, requesting products related to real life, and the use of evaluation methods and tools. If these criteria are not met at all in the lesson plan, they are represented with a "0", if they are partially met with a "1" and if they are fully met with a "2".

**Ethical considerations.** Ethical rules were followed in this study. In accordance with the ethical rules, the participants were informed before the study. Participant consent forms were obtained. Ethics committee permission numbered 2021/93 was obtained from Necmettin Erbakan University Social and Human Sciences Scientific Research Ethics Committee on 19.02.2021.

## Findings

In this section, the findings obtained from the study are given

In the current study, we tried to determine the effects of the differentiated instruction implemented for social studies teachers on their self-efficacy. For this purpose, the "Gifted Education Self-Efficacy Scale for Teachers" was used.

**Table 3.** Comparison of Self-Efficacy Post-Test Scores for the Groups Regarding the Education of Gifted Students

| Group | N | Mean Rank | Sum of Ranks | U | Z | p | Effect |
|---|---|---|---|---|---|---|---|
| Experimental | 13 | 19,04 | 247,50 | 12,500 | -3,705 | 0,000 | 0,72 |
| Control | 13 | 7,96 | 103,50 | | | | |
| Total | 26 | | | | | | |

*p< 0,05

As can be seen in Table 3, there is a statistically significant difference (U=12,500, Z=-3,705, p=0,000) in favor of the experimental group when comparing the post-test scores of teachers in the experimental and control group. It can be said that the difference has a large effect as the effect size of the calculated difference is r=0,72. Based on this result, it can be said that the differentiated instruction practices have contributed positively to the self-efficacy perceptions of the teachers in the experimental group regarding the education of gifted students compared to the teachers in the control group.

In the current study, the lesson plans developed by teachers were analyzed using descriptive analysis and content analysis. At the very beginning of the study, teachers in both groups (experimental and control groups) were provided with one learning outcome for social studies and they were asked to prepare an activity related to this learning outcome for the gifted students in their classes. Following the second teacher training, teachers in the experimental and control group were again given the same learning outcome and were asked to prepare activities for the gifted students in their classes. 16 criteria were determined based on expert opinions through the Maker model and Education Program for the Gifted Students to assess the activities. For each criterion, score points such as no=0, partial=1, and full=2 were given. The frequencies showing the assessments regarding the activities for differentiated instruction developed by the teachers are illustrated in Tables 4 and 5.

**Table 4.** Findings Regarding the Evaluation of Teacher Activities Initial-Final Implementation

| | Initial Implementation | | Final Implementation | |
|---|---|---|---|---|
| **Differentiated Items** | **Control** | **Experimental** | **Control** | **Experimental** |
| The learning outcome has been differentiated (Process) | 0 | 0 | 0 | 24 |
| Study for knowledge (Content) | 15 | 22 | 17 | 12 |
| The Lives of eminent persons (Content) | 0 | 0 | 0 | 1 |
| Interview with field experts (Content) | 8 | 2 | 6 | 0 |
| Abstractness (Content) | 3 | 5 | 5 | 14 |
| Complexity (Content) | 6 | 7 | 4 | 21 |
| The relationship of the activity with real life (Process) | 22 | 15 | 22 | 22 |
| Critical thinking (Process) | 2 | 5 | 0 | 25 |
| Problem-solving (Process) | 2 | 5 | 4 | 21 |
| Decision-making (Process) | 0 | 6 | 3 | 26 |
| Creative thinking (Process) | 5 | 5 | 8 | 19 |
| Learning methods (Process) | 8 | 2 | 8 | 6 |
| Scientific Research (Process) | 4 | 2 | 4 | 2 |
| Producing product (Product) | 6 | 4 | 8 | 12 |

| | | | | |
|---|---|---|---|---|
| Building real-life connections (Product) | 6 | 6 | 7 | 12 |
| Use of Assessment Methods and Tools | 0 | 0 | 0 | 16 |
| Total | 87 | 86 | 96 | 233 |

When Table 4 is examined, it is seen that the teachers in the experimental group who received differentiated instruction given to social studies teachers have learned how to differentiate the learning outcomes when developing the differentiated instruction content, their tendency to prepare differentiated activities formed by the study for knowledge have decreased, very few teachers have used activities regarding the lives of eminent persons, very few of them have used differentiation towards interviews with field experts, it has contributed to their ability to use the abstractness criterion, the complexity criterion, the criterion for building a real-life connection, the criterion for setting on the critical thinking skills while differentiating. They also reported that it has contributed to their ability to reflect their problem-solving skills in the activities. It also revealed that teachers reflected on their decision-making skills in the activities while differentiating. It also shows that their creative-thinking skills contributed to their ability to use the setting on a criterion, and their ability to use teaching methods while differentiating contributed to their ability to use the criteria for setting on at least a little. However, it did not have an effect on teachers' ability to use the criteria for setting scientific research skills while differentiating. Findings reveal that differentiated instruction given to social studies teachers contributed positively to teachers' ability to use the criteria in employing their skills for producing products, and for producing real-life products while differentiating. Finally, it is observed that it contributed to teachers' ability to use methods and tools for assessment while differentiating

**Table 5.** Evaluation of Differentiated Instruction Activities Developed by Teachers

| | **Experimental Initial (f)** | | | **Experimental Final (f)** | | | **Control Initial (f)** | | | **Control Final (f)** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **No** | **Partial** | **Full** | **No** | **Partial** | **Full** | **No** | **Partial** | **Full** | **No** | **Partial** | **Full** |
| The learning outcome has been differentiated | 13 | 0 | 0 | 0 | 2 | 11 | 13 | 0 | 0 | 13 | 0 | 0 |
| Study for knowledge | 1 | 2 | 10 | 6 | 2 | 5 | 4 | 3 | 6 | 4 | 1 | 8 |
| Lives of eminent persons | 13 | 0 | 0 | 12 | 1 | 0 | 13 | 0 | 0 | 13 | 0 | 0 |
| Interviews with field experts | 12 | 0 | 1 | 13 | 0 | 0 | 9 | 0 | 4 | 10 | 0 | 3 |
| Abstractness | 8 | 5 | 0 | 4 | 4 | 5 | 10 | 3 | 0 | 10 | 2 | 1 |
| Complexity | 9 | 1 | 3 | 1 | 3 | 9 | 8 | 4 | 1 | 10 | 2 | 1 |
| Building a connection with real-life | 3 | 5 | 5 | 0 | 4 | 9 | 1 | 2 | 10 | 1 | 2 | 10 |
| Critical thinking | 9 | 3 | 1 | 0 | 1 | 12 | 12 | 0 | 1 | 13 | 0 | 0 |
| Problem-solving | 10 | 1 | 2 | 2 | 1 | 10 | 12 | 0 | 1 | 10 | 2 | 1 |
| Decision-making | 9 | 2 | 2 | 0 | 0 | 13 | 13 | 0 | 0 | 11 | 1 | 1 |
| Creative thinking | 10 | 1 | 2 | 2 | 3 | 8 | 10 | 1 | 2 | 9 | 0 | 4 |
| Learning methods | 11 | 2 | 0 | 7 | 6 | 0 | 9 | 0 | 4 | 9 | 0 | 4 |
| Scientific Research | 11 | 2 | 0 | 11 | 2 | 0 | 11 | 0 | 2 | 11 | 0 | 2 |
| Producing product | 10 | 2 | 1 | 7 | 0 | 6 | 10 | 0 | 3 | 9 | 0 | 4 |
| Building real-life connections | 9 | 2 | 2 | 7 | 0 | 6 | 10 | 0 | 3 | 9 | 1 | 3 |
| Use of assessment methods and tools | 13 | 0 | 0 | 3 | 4 | 6 | 13 | 0 | 0 | 13 | 0 | 0 |
| Total | 151 | 28 | 29 | 75 | 30 | 100 | 158 | 13 | 37 | 155 | 10 | 43 |

0= No differentiation has been made 1=Partially differentiated 2=Fully (Totally correct) differentiated

When the data illustrated in Table 5 are examined, it is observed that the total frequency of not using 16 determined criteria by the teachers from the experimental group in the initial implementation is 151, while that of the teachers in the control group is 158. Based on the total post-test results, we can suggest that the total frequency of not using the 16 determined criteria by the teachers in the experimental group is 75, while that number is 155 for the teachers in the control group. The total frequency regarding the partial use of the 16 determined criteria by the teachers from the experimental group in the initial implementation is 28, while that number is 30 for the teachers in the control group. Based on the post-test results, it is suggested that the total frequency regarding the partial use of the 16 determined criteria by the teachers from the experimental group is 30, while that number is 10 for the teachers in the control group. The total frequency of fully using the 16 determined criteria by the teachers from the experimental group in the initial implementation is 29, while that number is 37 for the teachers in the control group. Based on the post-test results, it is suggested that the total frequency regarding the full use of the 16 determined criteria by the teachers from the experimental group is 100, while that number is 43 for the teachers in the control group. In light of these results, it can be said that the teachers in the experimental group who received differentiated instruction have developed their ability to prepare activities.

## Discussion

The current study has revealed that as a result of the differentiated training provided to teachers, there is a significant difference in their self-efficacy perceptions for implementing differentiated instruction practices toward gifted students. The study conducted by Suprayogi et al. (2017) in Indonesia revealed that there is a relationship between the effectiveness of differentiated instructional practices and the self-efficacy perceptions of teachers, and differentiated activities also increase as their self-efficacy perceptions develop. A revision of the literature shows that there are studies suggesting that teacher training has increased teachers' self-efficacy regarding the education of gifted students (Eker, 2000; Levent et al., 2018). The results of the current study support the literature. Based on the quantitative data obtained in the study, it was revealed that teachers' self-efficacy plays a vital role for teachers to implement differentiated instruction practices for gifted students.

According to the findings obtained from the assessment of teachers' activity plans as a result of the mentor-supported and long-term study, it was determined that the competencies of the participants (teachers) in developing and implementing differentiated activities have increased. Machu & Melek (2015) reported that even if they succeed in changing the curriculum content, teachers remain incapable to implement these changes in their classes. However, they found out that teachers improved their skills to implement within the classroom following the differentiated teacher training. In the study conducted by VanTassel-Baska et al. (2021), it is stated that teachers cannot use differentiated instruction practices effectively, however, their competencies regarding this matter have improved thanks to the teacher training conducted. In their applied study conducted for the teachers of gifted students, Levent et al. (2018) and Kurnaz & Aslantaş (2018) similarly reported that teachers were positively affected by the process of developing applied activity. It was revealed that both studies were useful because of their long-term practice, they ensured more permanent learning, and they increased the awareness and self-efficacy of teachers. The findings obtained through this study show similarities with the previous studies in the literature. Accordingly, mentor-supported differentiated instruction training provided to teachers improves teachers' planning skills related to teaching activities.

In order to raise students with 21st-century, teachers who have these skills and could effectively transfer them to their students are needed (Conklin & Frei, 2015; Yurtkulu, 2018). In Turkey, teachers are asked to make adaptations for gifted students that take their individual differences into consideration. However, it is reported that teachers face a lack of instructional practices appropriate for gifted students (Eker, 2020; Ekinci, 2002;

Yurtkulu, 2018). The insufficiencies they experience regarding this issue are tried to be eliminated through in-service training. However, the fact that in-service training courses generally remain at a theoretical level and are not practice-oriented (Bayram & Şentürk, 2021; Eker, 2020; Kurnaz & Aslantaş, 2018;) and they do not have mentor support (Eker, 2020; Kurnaz & Aslantaş, 2018; Kronborg & Plunkett, 2012) obstruct obtaining the desired performance. Based on the experience the researcher gained during the research and the obtained data, it is recommended that the differentiated teacher training model should also be implemented as an in-service training course.

## Conclusion

As a result of the study, it was determined that the differentiated instruction provided to social studies teachers had an effect on teachers' competence regarding the education of gifted students.

The differentiated instruction given to teachers increased teachers' self-efficacy toward implementing differentiated instruction to gifted students. This result indicates that the differentiated instruction given to social studies teachers have positively affected teachers' self-efficacy related to the education of gifted individuals. In-service training courses about the characteristics of gifted individuals and differentiation can be provided to teachers. Activities that could enhance teachers' self-efficacy regarding the education of gifted students should be included in further teacher training courses.

The differentiated instruction given to teachers has enhanced teachers' skills in preparing differentiated instruction activities for gifted students. It was concluded that teachers included all criteria more in their activity plans apart from 'study for knowledge' and 'interview with field experts' among criteria like study for knowledge, the lives of eminent persons, interview with field experts, abstractness and complexity, which include differentiation in terms of content for the conducted activities. It was also concluded that especially the criteria of abstractness and complexity were heavily used by teachers. In further teacher training courses, matters related to the differentiation of content for gifted students should be included.

Considering the criteria for the state of differentiating the learning outcome, building a connection with real-life, critical thinking, problem-solving, decision-making, creative thinking, learning methods, and orientation of students to scientific research, which include differentiation in terms of the process for the conducted activities, it was observed that teachers included all criteria more in their activity plans apart from the criteria of the orientation of students to scientific research, and they heavily used especially thinking skills and differentiating learning outcome in their activity plans. In light of the obtained data, it is concluded that teachers' ability to prepare differentiated activities has improved. In further teacher training courses, matters related to the differentiation of process for gifted students should be included.

When analyzing the criteria for producing a product and building real-life connections including differentiation in terms of product for the conducted activities, it is concluded that teachers included these criteria more in their activity plans as a result of the training. In further teacher training courses, matters related to the differentiation of products for gifted students should be included.

When analyzing the criteria for the use of assessment methods and tools, which includes differentiation in terms of assessment for the conducted activities, it is concluded that the training given as a result of the study has positively affected teachers' ability to assess differentiated activities. In further teacher training courses, matters related to the use of assessment methods and tools for gifted students should be included. Applied and mentor-assisted differentiation training for gifted students should be provided to teachers in all branches and grade levels. Training programs for developing differentiated activities with sample-based practices can be used as a model in in-service training courses.

**Ethical considerations.** Ethical rules were followed in this study. In accordance with the ethical rules, the participants were informed before the study. Participant consent forms were obtained. Ethics committee permission numbered 2021/93 was obtained from Necmettin Erbakan University Social and Human Sciences Scientific Research Ethics Committee on 19.02.2021.

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