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Development of Teacher Support Scale for Secondary School Students (TSSSSS): A Validity and Reliability Study

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Abstract

In this study, a valid and reliable scale (TSSSSS) was aimed to develop to measure secondary school students' perceptions of teacher support. The research was carried out on a total of 773 students studying in 6 different secondary schools in Ankara's Yenimahalle district in the Spring Term of the 2021-2022 Academic Year. The students who participated in the research voluntarily were divided into four study groups. The first study group consisted of 7th and 8th grade students for the pre-application of the scale. The second study group and the third study group consisted of 5th, 6th, 7th, and 8th grade students to determine the structure of the scale and verify the structure of the scale. The fourth study group consisted of students studying in the 7th and 8th grades of the school where the pre-application was made for the reliability study of the scale. The application form of the scale, which was created based on the literature review, was submitted to expert opinion for content and face validity and rearranged in line with the recommendations of the experts. As a result of the pre-application, some statements in the scale were changed based on the students' opinions. A structure with 36 items and four factors was gained with EFA, which explained 66.56% of the total variance. The factors of the scale were categorized under the names of emotional support (10 items), instructional support (5 items), guidance and orientation support (12 items), and problem-solving support (9 items). The structure of the scale was confirmed by CFA. Reliability coefficients obtained by Cronbach Alpha, composite reliability, and the test-retest method were examined for the reliability of the measurements related to the dimensions of the TSSSSS, and it was found that the reliability was quite high. The analyses carried out to determine the distinctiveness of the items on the scale revealed that all of the items were distinctive. In addition, as a result of examining the Pearson product-moment correlation coefficients calculated for the sub-dimensions of the TSSSSS after the item analysis, it was determined that the compatibility and the correlation between the dimensions of the scale were high. Based on these findings, it can be said that TSSSSS is a valid and reliable scale that can be used to measure secondary school students' perceptions of teacher support.

Keywords: Secondary school students, Teacher support, Scale development

Introduction

In daily life, the stressful situation that one is exposed to can cause the person to experience physical, emotional, behavioral, and mental problems, as well as to contract a chronic disease (Özel & Bay Karabulut, 2018, p.48). Social support is among the protective factors that protect or buffer the individual from the physiological or psychological consequences of exposure to a stressful situation (Cassel, 1976). Social support can be viewed as the support that an individual can access from other individuals, groups, and the wider community through social ties (Lin, Ensel, Simeone, & Kuo, 1976). Social support is about having the perception or experience of being cared for, respected, and part of a mutually supportive social network (Taylor, 2011). It is thought that the social support that the individual receives from his family members, friends, or close circle will help him get through the stressful periods more easily. Studies have shown that social support is associated with stress (Wang, Cai, Qian, & Peng, 2014), depression (Alsubaie, Staind, Websterd, & Wadma, 2019; Scardera et al., 2020; Wang et al., 2014), and anxiety (Scardera et al., 2020). Social support improves the negative effects of burnout on individuals' health (Ruisoto et al., 2021), increases their self-esteem (Cui et al., 2021; Poudel, Gurung, & Khanal, 2020), benefits subjective and psychological well-being (Brajša-Žganec, Kaliterna-

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Lipovčan, & Hanzec, 2018; Poudel et al., 2020), and contributes to mental health (Cobo-Rendón, López-Angulo, Pérez-Villalobos, & Díaz-Mujica, 2020).
There are different views in the literature on the types of social support. Schaefer, Coyne, and Lazarus (1981, pp. 385-386) analyze social support under three headings: emotional support, tangible support, and informational support. Emotional support includes closeness and commitment, trusting and being trusted. Tangible support includes direct assistance or services (for example, giving money, goods, or gifts and caring for the needy or doing a chore for them, etc.). Informational support includes providing information and advice that can help a person. House (1981, cited in Tindle, 2012) argues that social support has dimensions of emotional concern (liking, love, empathy), instrumental aid (goods or services), information (about the environment), or appraisal (information relevant to self-evaluation). Concerning appraisal support, feedback, and validation, they include assurance that an individual is successful in a particular task, is valued, and is a respected person (Zhang, Chen, & Yuen, 2021). Veiel (1985) classifies social support types in the literature under two categories: psychological/instrumental support and crisis help/everyday support. This classification emphasizes the ways and purposes of social support. Everyday social support can be effective in the development of an individual's personality traits. On the other hand, crisis help aims to combat certain crises and stress factors and directly reduce their effects (Veiel, 1985).

Teacher Support
The school is one of the most important structures that enables students to socialize, interact with each other, and establish social networks. In the school context, administrators, teachers, peers, and school staff form parts of the student's social network. In terms of providing social support, it can be said that the most important part of the student's social network is the teachers. Teachers can provide social support to students in various dimensions such as emotional support, instrumental support and informational support. In the literature, the social support provided by the teacher is specifically expressed as teacher support. Teacher support is the value students see in their teachers and the degree of relationship they establish with them (Ryan & Patrick, 2001).

Hamre and Pianta (2007) mention three teacher supports under the Teaching Through Interactions (TTI) framework to conceptualize and measure classroom interactions between teachers and students: emotional supports, classroom organization, and instructional supports. Emotional support offered in the classroom is related to teachers' efforts to support students' social and emotional functioning in the classroom by positively facilitating teacher-student and student-student interactions (Pianta, Hamre, & Allen, 2012). Classroom organization is about organizing classes to support students' ability to regulate behavior and attention in the classroom so that they can make the most of learning opportunities (Hafen et al., 2015). Classroom organization includes teacher behavior management aimed at promoting positive behavior and preventing or ending undesirable behavior in the classroom (Pianta et al., 2012), productivity for students to best manage teaching time and routines so that they can make the most of learning opportunities, engaging students by providing engaging activities, instruction, centers, and materials, and using instructional learning formats to maximize learning ability (Hamre et al., 2013).

Instructional support includes teachers' development of students' conceptual and high-level thinking skills, providing feedback to students about their learning to make the most of teaching opportunities, and effective use of language for a social environment and knowledge transfer (La Paro, Pianta, & Stuhlman, 2004; Pianta et al., 2012). Skinner and Belmont (1993) used the model developed by Connell & Wellborn (1991) based on a motivational analysis of self-system functioning, which includes three basic psychological needs (competence, autonomy, and relatedness), while establishing the dimensions of teacher support. Connell & Wellborn (1991) argue that when individuals' psychological needs are met in particular cultural initiatives such as family, school, or work, participation occurs and manifests itself in emotion, behavior, and cognition. From this point of view, according to Skinner and Belmont (1993), three teacher behaviors that should encourage the fulfillment of children's basic psychological needs are structure, autonomy support, and involvement. These three behaviors can be summarized as follows: teachers ideally structure their classrooms to meet the student's need for competence, give the student the freedom to determine their behavior to meet the need for autonomy, and are involved with the student to meet the need for relatedness.

Teacher support, like social support, has effects on an individual's mental health (Wit, Karioja, Rye, & Shain, 2011) and subjective well-being (Suldo et al., 2009). Reddy, Rhodes, and Mulhall (2003) and Wit et al. (2011) found that teacher support was associated with students' self-esteem and depression, and as students' perceptions of teacher support increased, there was a decrease in depressive symptoms and an increase in self-esteem. The results of the study conducted by Conner, Miles, and Pope (2014) in academically successful high schools show that students who think their teachers care about them and who have confidants at school experience less academic anxiety, school stress, and internalization symptoms. Wang et al. (2014), on the other

hand, found that teacher support has a positive effect on student happiness and satisfaction. Teacher support is more specifically related to educational outcomes than social support, or can be more effective in achieving desired outcomes. Teacher support is positively associated with student motivation (Ryan & Patrick, 2001) and engagement (Skinner, Furrer, Marchan, & Kindermann, 2008; Strati, Schmidt, & Maier, 2017). Teacher support indirectly affects students' mathematics achievement (Yıldırım, 2012; Yıldırım & Yıldırım, 2019; Yu & Singh, 2018) and their interest in mathematics lessons (Yu & Singh, 2018) through students' math self-efficacy. Teacher support can be seen as an important factor in removing barriers to effective teaching, as it is negatively associated with school problems, inattention, and hyperactivity disorders (Tennant et al., 2014) and has a positive effect on peer conflict resolution (Wang et al., 2014).

Measuring Teacher Support

In the literature, some scales measure teacher support as a dimension of social support (Harter, 1985, 2012; Malecki, Demaray & Elliott, 2004; Yıldırım, 1997) or support from important people other than friends and family (Zimet, Dahlem, Zimet, & Farley, 1988). It is also possible to come across scales measuring teacher support in different contexts. The "Classroom Assessment Scoring System Tool" developed by Pianta, La Paro, and Hamre (2008) and the "Classroom Life Instrument" developed by Johnson, Johnson, and Anderson (1983) to measure teacher and student interaction have various dimensions of teacher support. On the other hand, there are also scales measuring general teacher support under similar concepts (McWhirter, 1996; Torsheim, Wold, & Samdal, 2000). Recently, it has been seen that scales measuring the support provided more specifically in some subjects rather than the support of the teacher have also been developed. For example, the "Career-Related Teacher Support Scale" was developed to measure the extent to which teachers support students' career development by Zhang et al. (2021). The "Student Experience Teacher Support Scale" was developed to determine the support that students who are exposed to aggression and bullying receive from their teachers if they tell their teachers about what they did to them (Nelson, Kendall, Burns, Schonert-Reichl, and Kane, 2019). Karabenick and Sharma (1994), on the other hand, developed the "Perceived Teacher Support of Questioning Scale" in order to reveal how teachers respond to other students as well as to themselves when their teachers are teaching or explaining something in the classroom.

Rationale and Purpose of the Research

In the school environment, students may need support in many ways, and teachers play an important role in providing this support. The literature review shows that teacher support can lead to some positive results in terms of education as well as protecting the physical and mental health of the student. Teacher support can help increase academic achievement, reduce disciplinary problems or peer bullying at school, and create suitable conditions for effective teaching. The main reason underlying the student's failure or negative behavior may be the lack of support they need. In this context, first of all, it is necessary to determine the areas that form the basis of the problem and need support. A teacher who is aware of the needs of his students can show a more understanding approach towards them when faced with a negative situation and can carry out studies to meet these needs.

Teacher support gains importance, especially at the secondary school level, which is the transition phase from childhood to adolescence. Because the adolescence period, where biological, social, and emotional changes are experienced rapidly, can be seen as a difficult process for many young people. During this period, young people show rapid physical development (Cenkseven, 2002), have a turbulent mood because they have not yet learned to control the effects of hormones, and react instinctively to the events around them because the connection between the emotional and intellectual parts of the brain is not fully formed (Jensen & Nutt, 2017). At the same time, during this period, students enter a more intense academic pace. Since the central exam or academic success will be effective in the transition to a higher education level, they need to work harder. Expectations and pressures of teachers, families, or the environment in this regard can cause stress on students (Deb, Strodl, & Sun, 2015; Reddy, Menon, & Thattil, 2018; Seçer & Gençdoğan, 2012). High academic stress is associated with psychological problems such as depression, anxiety, and burnout experienced by students (Deb et al., 2015; Fariborz, Hadi, & Ali, 2019; Zhang et al., 2022). However, ongoing stress related to education has negative effects on students' learning capacity, academic success, and physical and mental health (Pascoe, Hetrick, & Parker, 2020). In this case, depending on the characteristics of the period they are in, secondary school students are likely to experience difficulties in social, emotional, and academic terms. Therefore, it seems important for students to be supported by others, especially their teachers, so that they can pass this period healthily and successfully.

The physical, mental, and emotional development characteristics of students and their needs differ according to the education level. Therefore, the type and quality of teacher support are likely to vary according to the education level. Based on the literature review, it can be said that the measurement tools developed to measure teacher support are not specific to education levels. In this context, it can be said that there is a need for teacher support scales specific to educational levels. More specifically, a new measurement tool needs to be developed

to determine the types of teacher support needed by students at the secondary school level, which is accepted as the beginning of adolescence. Again, although the scales developed in the literature present the dimensions of teacher support in different contexts, they do not provide information about the way or purpose of support. Undoubtedly, teachers offer support to students in many ways. Although it is not possible to measure or reveal all teacher support, information can be obtained about the types of support that are considered important for students, such as emotional, instructional, guidance and orientation, and problem solving. However, the literature's social support scales (Harter, 1985, 2012; Malecki et al., 1999; Yıldırım, 1997) used to measure teacher support do not provide information about the specific type of support. Additionally, while the measurement tool (Pianta et al., 2008) used to measure teacher support does have emotional or instructional support dimensions, it does not encompass crucial types of support such as guidance, orientation, and problem-solving. Moreover, the scale (Torsheim et al., 2000) used to measure teacher and classmate support only provides limited information about teacher support due to the small number of items in the tool, and some scales (Karabenick & Sharma, 1994; Zhang et al., 2021) are only used for special situations rather than general teacher support. These limitations highlight the need for the development of a new and comprehensive scale on teacher support. In particular, although many measurement tools have been developed to measure teacher support and type in different contexts in the international literature, it is seen that the social support scales, which are adapted (Cırık, Oktay, & Fer, 2014; Gökler, 2007) to or developed in Turkish (Yıldırım, 1997), are used in studies because there is no measurement tool to serve this purpose in Turkey. The use of a teacher support scale developed in Turkish can help to evaluate the research results in the context of Turkey. In this direction, the study aims to introduce a new scale specific to the secondary school level, which reveals the type, purpose, and method of teacher support, in the literature.

Method

Study Group

In this study, there were four different study groups whose participants were secondary school students in the spring term of the 2021-2022 academic year. The first study group consisted of 34 students, 16 girls, and 18 boys, who were selected from the 7th and 8th grade students of a secondary school in the Yenimahalle district of Ankara for the pre-application of the scale. 12 of the students in this group are in the 7th grade, and 22 of them are in the 8th grade. To determine and verify the structure of the scale, an application was made to secondary schools in the Yenimahalle district of Ankara. As a result of the application, 804 students provided data. However, during the preparation of the data for analysis, it was observed that there were many unanswered items in some measurement tools or that the same answer was given to all items. The measurement tool for 98 students with such problems was removed from the data set. Then, the data obtained from the remaining 706 students was divided into two groups, and the second study group for exploratory factor analysis (EFA) and the third study group for Confirmatory Factor Analysis (CFA) were obtained. The second study group created for EFA consisted of 183 female students (51.84%) and 170 (48.16%) male students. Of the students in this group, 93 (26.35%), 89 (25.21%), 72 (20.40%), and 99 (28.05%) are in the 5th, 6^{th,} 7th, and 8th grades, respectively. In the study group created for CFA, there were 206 (58.36%) female and 147 (41.64%) male students. Of the students in this group, 82 (23.23%), 75 (21.25%), 84 (23.80%), and 112 (31.73%) are in the 5th, 6^{th,} 7th, and 8th grades, respectively. The fourth study group consists of a total of 33 people: 20 girls and 13 boys, selected from the 7th and 8th grade students of the school where the pre-application was made to benefit from the test-retest method for the reliability study of the scale. 16 of the students in this group are in the 7th grade, and 17 of them are in the 8th grade.

Scale Development Stages

The following stages (DeVellis, 2021; Erkuş, 2012; Şeker & Gençdoğan, 2020) were followed for the development of the TSSSSS:

Step 1: Determination of the Structure to be Measured and Literature Review

As the current research aims to introduce a new measurement tool specific to the secondary school level, which reveals the type, purpose, and way of teacher support, to the literature, first of all, the theoretical structures that form the basis of teacher support were examined. To create the scale structure, the social support types of House (1981, cited in Tindle, 2012) were reconsidered according to the classification of Veiel (1985). Accordingly, it was considered necessary to develop a four-dimensional scale: emotional support, instructional support, guidance and orientation, and problem-solving support. Emotional support, instructional support, guidance and orientation support are the types of social support that the teacher continuously provides to support the emotional, cognitive, or behavioral development of the student when there is no problem, in other words, in ordinary situations. Problem-solving support, on the other hand, refers, as the name suggests, to the support provided by the teacher to help solve the problem in extraordinary situations when the student encounters a problem in or out of school. The teacher can offer one or more types of social support to solve the problem. For

example, taking care of the student when he or she has a problem can both help solve the problem and provide the emotional support that the student needs. Or, the guidance offered to the student can bring a solution to an area where the student has a problem. In this context, it is difficult to make a clear distinction between types of support. However, it has been decided to classify the types of support in this way since the problem-solving support provided in extraordinary situations differs from the types of support offered in ordinary situations in terms of shorter duration, when the student requests it, or when the teacher's intervention is necessary. The content of the types of support given in ordinary and extraordinary situations, the place where it is given, and the reason for it are explained below.

Emotional Support
It is about the behaviors exhibited by teachers to meet the feelings of trust, love, and value that students need in the school environment. A loving, empathetic, and egalitarian approach to students and trusting relationships are important in providing emotional support. Emotional support is one of the supports that the teacher can offer in or outside the classroom. In a way, it reveals what kind of approach a teacher should have in his relationship with his students.

Instructional Support
It is about providing feedback to students on-course performance, making additional efforts to improve student learning, helping students directly, motivating students to be successful, and encouraging student participation in the lesson. Instructional support is a type that takes place mostly in the classroom environment and can be offered to students during the lesson. The teacher's encouragement of students to increase their participation in the lesson can provide emotional support. For student learning, the teacher's checking the student's homework and giving him feedback can be evaluative support. The teacher can offer instrumental support by helping students with activities.

Guidance and Orientation Support
It is about providing information to students for the solution of problems, guiding them, giving feedback on the correctness of their behavior, informing them about the activities to be done in and outside the class, and encouraging participation in these activities. Guidance and orientation support is a type of support based on informing the student to support the student's development in different aspects. It may also include an evaluative approach to develop positive behavior in students. This type of support also takes place in the classroom environment and can be offered to students outside of the classroom.

Problem-Solving Support
This type of support is aimed at helping the student solve problems arising from school or outside of school. Sometimes the solution of the problem may require the direct intervention of the teacher, as with instrumental support. On the other hand, listening to the student can provide emotional support for the solution of the problem. Or, students can be informed about who can get support for solving the problem.
Step 2: Establishing the Item Pool and Determining the Scale Type
After determining the structure to be measured, expressions in the dimensions of social support were transformed into explanatory expressions reflecting teacher support, and a pool of 52 items was created. The distribution in the item pool is as follows: There are 13 items in the emotional support dimension, 15 items in the instructional support dimension, 12 items in the guidance and orientation support dimension, and 12 items in the problem-solving support dimension.
The Likert scale, which is widely used in tools that measure thoughts, beliefs, and attitudes, follows the answer options that show the various levels of agreeing with or confirming the item presented as a statement expressing a sentence (DeVellis, 2021). In the Likert-type attitude scale, grades can be 3, 5, 7, 9, or even 11. However, the 5-point rating is the most used because it is optimum (Tavşancıl, 2010, p.145). Responses on a 5-point Likert scale are usually graded as "strongly disagree = 1" and "strongly agree = 5". Hodge and Gillespie (2007) claim that the commonly used odd-numbered scales such as the 5-point Likert that use the midpoint have some difficulties, and they explain this situation as follows: The midpoint functions as a means of expressing an option such as "I don't know", "no opinion," or "I haven't thought about it". If a "no opinion" response is presented, some participants who are unsure of their degree of intensity may choose the "no opinion" response as a way to avoid the mental work associated with reasoning. The research scale was developed as a 6-point Likert type in order not to offer an escape option such as "no opinion" and to determine the degree of participation of the participants in the items on the scale. Therefore, the answers given to the statements on the scale were graded as Strongly Agree (6), Agree (5), Partially Agree (4), Partially Disagree (3), Disagree (2), and Strongly Disagree (1).

Step 3: Reviewing the Item Pool by Experts and Creating the Test for the Pre-Application (Pilot Study)

It is an important issue in research to reveal the purpose of the test and how appropriate the items in the test are with the qualifications to be tested and the scope to be measured (Ellez, 2012), in other words, the content validity of the test. For this reason, the created item pool was sent to two experts in educational sciences, and the experts were required to examine and assess the items in terms of scope. In line with the opinions and suggestions of the experts, two items under emotional support, one item under instructional support, three items under guidance and orientation support, and three items under the problem-solving dimension were rearranged. In addition, based on expert opinions, two items were added to the dimension of guidance and orientation support, and one item in the dimension of problem-solving was eliminated. Thus, it was tried to increase the representation power of the dimensions of the items in the measurement tool and to make sure that the scale has content validity. The 53-item draft form, which was obtained as a result of the arrangements made, was submitted for the opinion of two Turkish teachers working in secondary schools to check it in terms of compliance with the Turkish spelling rules and intelligibility. In line with the suggestions of the teachers, a 53-item test was created for the pre-application by including additional explanations in parentheses (for example, work, additional studies, activities, etc.) to make some expressions in the items more understandable.

Step 4: Pre-Application

The scale that is planned to be developed needs to be implemented with 30 to 50 people who can exemplify the target group (Şeker & Gençdoğan, 2020). With the pre-application, it can be determined whether the scale items are understood by the target group and whether the questions are working or not (Cemaloğlu, 2012). For the pre-application, 34 students studying in the 7th and 8th grades were determined to be the sample that could best represent the target group of the research. The reason why the study group was chosen from students in the 7th and 8th grades for the pre-application is that the students in this group attend more face-to-face education than the 5th and 6th grade students. The perceptions of students participating in face-to-face education about teacher support may be more specific. However, the reasons for choosing the school, which is included in the research sample and where one of the researchers works, can be listed as follows: (1) determining the average time it takes for the participants to complete the scale during the pre-application; (2) observing whether the participants have difficulties filling out the scale; and (3) having the opportunity to interview the participants about the items that should be added to or removed from the scale after the pre-application.

The pre-application took about 30 minutes on average. During the pre-application of the scale, it was observed that the participants had difficulty understanding the expression "promote" in some of the items under instructional support.

Step 5: Creation of a New Test for Application

In line with the suggestion of Turkish teachers, the word "encourages" was used instead of the phrase "promote", which the participants had difficulty understanding, to ensure a better understanding of the items. After the pre-application, the participants were interviewed and asked if there was an item that was not understood or if there was any statement they wanted to add. From the opinions of the participants, it was concluded that no changes were required in the items prepared for the scale or in the instructions for the scale. With these changes, it was decided to apply of the scale to a larger study group.

Step 6: Post-Application Analysis and Finalization of the Scale

After the application, the construct validity of the scale was examined first. Thanks to factor analysis, it is possible to get an idea about whether the scores obtained from the test related to construct validity measure the quality that the test is thought to measure (Ellez, 2012, p.185). Two approaches can be mentioned in determining construct validity: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA is used to determine the dimensions, or in other words, the factors explained by the concepts (Durmuş, Yurtkoru, & Çinko, 2011). On the other hand, CFA is used to test whether the said structure is verified or not, based on the data obtained from the measurement tool developed in line with a theoretical structure (Çokluk, Şekercioğlu, & Büyüköztürk, 2012). Fabrigar, Wegener, MacCallum, and Strahan (1999) state that it is generally beneficial to use EFA and CFA in conjunction with each other, and if the sample in a single study is large enough, the sample can be randomly divided into halves and EFA can be performed in the first stage to provide a basis for the DFA model.

In this direction, two groups of 353 people were obtained by dividing the data obtained from 706 students randomly and in equal numbers as a result of the application to carry out EFA and CFA studies. Thus, the second and third study groups of the research were obtained. In the literature, there are different opinions about the required sample size for factor analysis. Cattel (1978) states that a sample size of 500 people is good for factor analysis, but a sample of 250 or 200 can be accepted as well. Tabachnnick and Fidell (2013, cited in Pallant, 2020) state that there should be at least 300 participants for factor analysis. Comrey and Lee (1992, cited in MacCallum, Widaman, Zhang, & Hong, 1999) provide a rating for adequate sample sizes in factor

analysis as follows: 100 = poor, 200 = fair, 300 = good, 500 = very good, and 1,000 or more = excellent. Based on the opinions of these researchers, it can be said that a study group of 353 people would be suitable for EFA. Again, considering that the sample size is sensitive to 200 in CFA (Şekercioğlu, 2009), it can be said that a sample of 353 people would be suitable for CFA.

Factor analyses were performed to reveal the structure of the scale based on the measurements obtained from the second and third study groups. The SPSS 22.0 program was used for performing EFA on the second study group, Lisrel 8.7 program was used for performing CFA on the third study group.
After the application, the reliability of the scale was examined secondarily. In studies, reliability is explained by two situations: the difference between the real situation and the measured situation in terms of accuracy, and a stable and consistent measurement in terms of consistency (Şeker & Gençdoğan, 2020). Different methods can be used to calculate reliability. One of these methods is the test-retest method. In the test-retest method, the continuity or stability coefficient is calculated based on the result of applying the same measurement tool to the same group after a certain period (Tavşancıl, 2010). The underlying rationale for such reliability determinations is this: If a measurement accurately reflects some meaningful construct, then that construct should be comparatively evaluated in different situations (DeVellis, 2021, p.51).

Cronbach's alpha and composite reliability coefficients were calculated for the reliability of the measurements obtained from the second and third study groups. On the other hand, the stability coefficient of the scale was calculated by applying the test-retest method on the data obtained from the fourth group of the study. Calculation of Cronbach's alpha coefficient and determination of test-retest reliability were carried out using the SPSS 22.0 program. The values obtained from CFA were calculated in Microsoft Excel 2010 by replacing them in the formula (İlhan & Çetin, 2014) used to calculate the composite reliability coefficient.

Findings

Findings Regarding Construct Validity

EFA was performed on the data obtained from the second study group, and CFA was performed on the data obtained from the third study group for the construct validity of the scale.

EFA Findings

KMO value and Bartlett test results were examined to determine whether the data were suitable for factor analysis. Since the KMO value (.964) was greater than .50 and the Bartlett test was statistically significant ($\chi 2 = 10706.120$, $df = 630$, $p = .000$), the data were found to be suitable for analysis. In EFA, the analysis was carried out depending on the choice of principal component factorization technique and varimax rotation method. The difference between the highest load value of an item in the factor and the highest value after this value is required to be at least .10 (Büyüköztürk, 2007). Analysis results showed that 3 items from the first factor (emotional support dimension), 10 items from the second factor (instructional support dimension), 2 items from the third factor (guidance and orientation support dimension), and 2 items from the fourth factor (problem-solving support dimension) did not meet this expectation or were in dimensions that did not comply with the theoretical structure. When these items were removed from the data set and analyzed again, it was seen that the remaining 36 items were collected in a four-factor structure, consistent with the theoretical explanations and overlapping with the scale structure predicted by the researchers. The four-factor structure of the scale explains 66.56% of the total variance. EFA findings are given in Table 1.

Table 1. EFA findings

Item Number	1. Factor	2. Factor	3. Factor	4. Factor
I1	.77			
I2	.74			
I3	.73			
I4	.67			
I5	.67			
I6	.66			
I7	.65			
I8	.59			
I9	.58			
I10	.57			
I11		.73		
I12		.69		
I13		.62		
I14		.58		

I15		.55		
I16			.79	
I17			.78	
I18			.75	
I19			.74	
I20			.69	
I21			.65	
I22			.63	
I23			.61	
I24			.61	
I25			.60	
I26			.59	
I27			.58	
I28				.72
I29				.69
I30				.68
I31				.66
I32				.65
I33				.64
I34				.64
I35				.62
I36				.60
Eigenvalue	2.30	1.31	18.96	1.40
Explained Variance	17.81	11.66	21.32	15.78
Total Variance	17.81	29.47	50.79	66.56

As can be seen from Table 1, the factor loads of the items on the scale vary between .55 and .79. Considering that "factor loading values of .45 or higher is a good criterion for item selection" (Büyüköztürk, 2007, p.124), it can be said that the loading values of the items in the scale are of the desired quality.

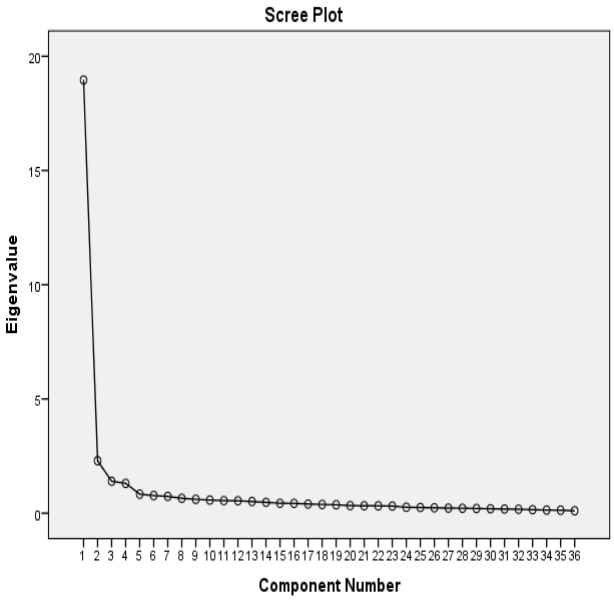

Figure 1. Distribution chart of the factors of the scale

CFA Findings

CFA was performed to confirm the four-factor structure of the scale. As a result of CFA, the fit indices for the scale structure were found to be $\chi 2 = 1964.16$ ($p = .00$), $df = 588$, $\chi 2 / df = 3.34$, *RMSEA* = .08, *CFI* = .95, *NFI* = 94, *IFI* = .95 and *SRMR* = .07. When the fit indices obtained as a result of CFA are evaluated according to the criteria given in Table 2, it can be stated that the fit indices are at an acceptable level and the construct validity of the TSSSSS was confirmed.

Table 2. Good fit and acceptable fit indices

Good fit indices	Acceptable fit indices
$0 \leq \chi 2/df \leq 2$	$2 < \chi 2/df \leq 5$
$0 \leq SRMR \leq .05$	$.05 < SRMR \leq .10$
$.97 \leq CFI \leq 1.00$	$.95 \leq CFI < .97$
$.95 \leq NFI \leq 1.00$	$.90 \leq NFI < .95$
$.95 \leq IFI \leq 1.00$	$.90 \leq IFI < .95$
$0 \leq RMSEA \leq .05$	$.05 < RMSEA \leq .08$

Source: Çokluk et al., 2012; Meydan & Şeşen, 2011; Schermelleh-Engel, Moosbrugger, & Müller, 2003

When the factor loading values obtained as a result of the CFA in Figure 2 are examined, it is seen that the other items have a load value higher than .45, except for one item (I11) in the dimension of instructional support. Kim-Yin (2004) suggested specific sample sizes to decide whether an item should remain on the scale. For example, for an item with a factor load of .30, the sample size should be at least 350 (cited in Şencan, 2005). Considering that there were 353 participants in the study group created for CFA and the factor load value (.73) in the result of EFA was greater than .45, it can be stated that there is no need to remove the item from the scale. The t-test values obtained from CFA are given in Table 3.

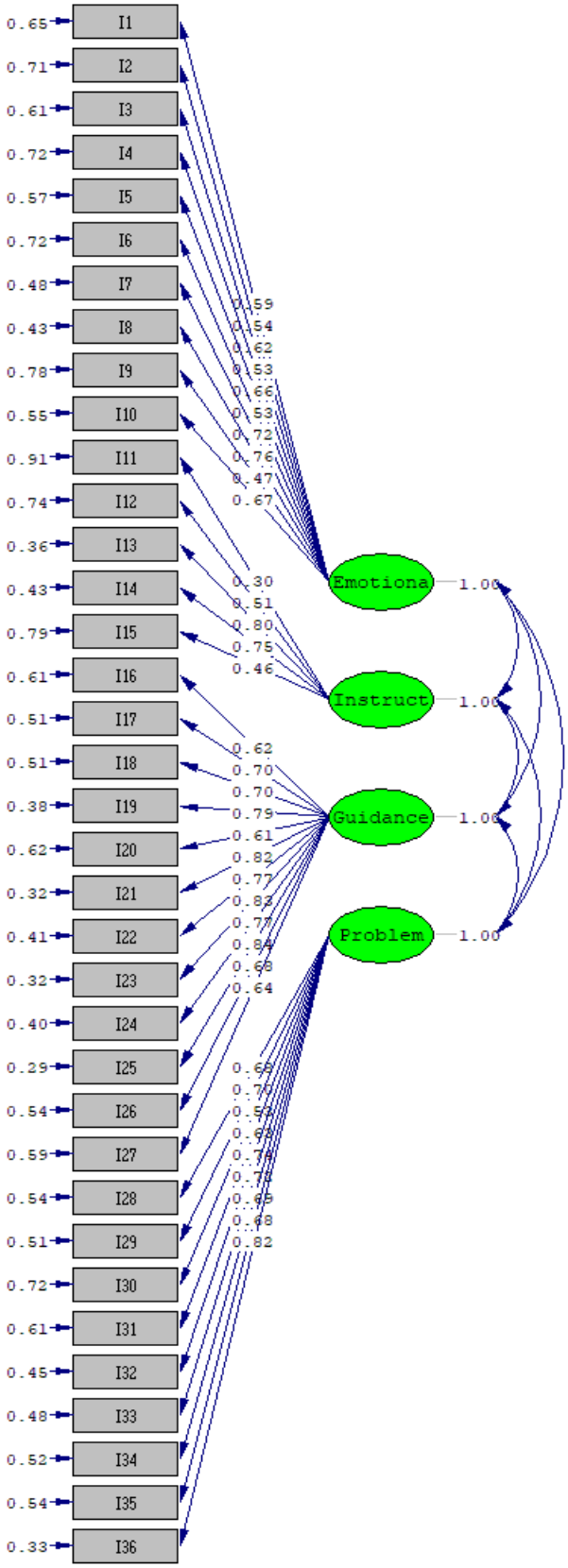

Figure 2. Factor loads obtained from CFA (Standardized Solutions)

Table 3. t-test values obtained from CFA

Item	t	Item	t
I1	11.53*	I19	17.51*
I2	10.32*	I20	12.52*
I3	12.31*	I21	18.71*
I4	10.18*	I22	16.91*
I5	13.23*	I23	18.81*
I6	10.03*	I24	17.01*
I7	14.84*	I25	19.34*
I8	15.92*	I26	14.16*
I9	8.74*	I27	13.10*
I10	13.64*	I28	13.96*
I11	9.26*	I29	14.66*
I12	9.42*	I30	10.32*
I13	16.64*	I31	12.67*
I14	15.38*	I32	15.78*
I15	8.46*	I33	15.14*
I16	12.68*	I34	14.38*
I17	14.76*	I35	14.02*
I18	14.89*	I36	18.29*

*$p < .01$

When the t values obtained as a result of CFA in Table 3 are examined, it is seen that the values vary between 8.46 and 19.34. The fact that the calculated t values are greater than 2.576 shows that they are significant at the level of .01 (Jöreskog & Sörbom, 1993, cited in Şimşek, 2007). Based on the t values obtained as a result of CFA, it can be said that the items in the scale are in the relevant sub-dimensions following the theoretical structure, and there is no need to remove any item from the model.

Findings Regarding Reliability

Cronbach's alpha for the reliability of the measurements obtained from the second study group and composite reliability coefficients for the reliability of the measurements obtained from the third study group were calculated. To determine the test-retest reliability of the study, two applications were made on 33 students with two-weeks intervals, and the correlation coefficient between the scores obtained from the two applications, in other words, the stability coefficient was calculated. The Cronbach's alpha, composite reliability, and stability coefficients for the measurements obtained from the study groups are given in Table 4.

Table 4. Cronbach alpha, composite reliability, and stability coefficients for measures obtained from study groups

Dimensions	Cronbach's Alpha	Composite Reliability	Stability
Emotional support	.92	.86	.94
Instructional support	.88	.71	.91
Guidance and orientation support	.95	.93	.93
Problem-solving support	.94	.89	.94

When Table 4 is examined, it is seen that the reliability coefficients vary between .71 and .94. Considering that the reliability of the scale is considered good if the coefficient is .70 and above (Büyüköztürk, 2007; Kılıç, 2016), it can be said that the scale is reliable.

Findings Related to Item Analysis

To determine the discrimination levels of the items in the TSSSSS, first of all, the data obtained from 706 people as a result of the application of the scale were divided into 27% lower-upper groups. Then, the corrected item-total correlations of the scale and the t-values related to the difference in the 27% lower and upper group item scores were calculated. The findings of the item analysis are given in Table 5.

Table 5. Corrected item-total correlations of the scale and t-values for 27% lower-upper group difference

Item	Item-total correlations	t	Item	Item-total correlations	t
I1	.75	-19.83*	I19	.76	-18.94*
I2	.70	-18.98*	I20	.75	-18.19*
I3	.68	-20.47*	I21	.81	-19.10*
I4	.71	-17.51*	I22	.76	-19.94*
I5	.73	-20.72*	I23	.80	-20.78*

I6	.73	-20.48*	I24	.76	-22.07*
I7	.72	-16.45*	I25	.80	-20.50*
I8	.77	-19.90*	I26	.81	-19.86*
I9	.75	-17.40*	I27	.74	-20.10*
I10	.77	-19.20*	I28	.82	-18.81*
I11	.63	-14.79*	I29	.82	-19.98*
I12	.73	-13.31*	I30	.69	-14.90*
I13	.78	-16.50*	I31	.79	-16.70*
I14	.78	-17.50*	I32	.75	-17.84*
I15	.70	-17.69*	I33	.73	-20.95*
I16	.79	-19.85*	I34	.80	-18.35*
I17	.82	-18.56*	I35	.77	-19.10*
I18	.76	-16.57*	I36	.81	-20.07*

*$p < .01$

When Table 5 is examined, the corrected item-total correlations of the scale were between .63 and .82; the t (sd = 294) values of the 27% lower and upper groups determined according to the total scores, on the other hand, vary between -22.07 ($p < .01$) and -13.31 ($p < .01$). It is desirable that the item-total correlation coefficient be at least .20 ($df = 100, p \leq .05$) or .25 ($df = 100, p \leq .05$) (Tavşancıl, 2010, p.148). It can be said that the items in the scale have a distinctive feature based on the corrected item-total correlations of the scale being above .25 and the t-values related to the differences in the item scores of the 27% lower and upper groups are statistically significant.

After item analysis, Pearson product-moment correlation coefficients were calculated to examine the compatibility and relationships between the sub-dimensions of the TSSSSS. The Pearson product-moment correlation coefficients for the sub-dimensions of the scale are given in Table 6.

Table 6. Pearson product-moment correlation coefficients for the sub-dimensions of the scale

	1.	2.	3.	4.
1. Emotional support	-			
2. Instructional support	.79*	-		
3. Guidance and orientation support	.76*	.79*	-	
4. Problem-solving support	.77*	.78*	.86*	-

*$p < .01$

When Table 6 is examined, it is seen that the correlation coefficients between the sub-dimensions of the scale vary between .76 and .86 and are statistically significant ($p < .01$). Based on these findings, it can be said that there is a high level of compatibility and correlation between the dimensions of the scale.

Conclusion and Recommendations

In this research, studies were conducted to develop a valid and reliable scale (TSSSSS) to reveal secondary school students' perceptions of teacher support. In the development of the scale, the steps in the literature (DeVellis, 2021; Erkuş, 2012; Şeker & Gençdoğan, 2020) were followed. Research data were obtained from four different study groups. A pre-application of the 53-item draft scale was performed on the first study group, and the participant's views on the duration of completing the scale, the difficulties they encountered in completing the scale, and the items that should be added to or removed from the scale were obtained. Some expressions in the scale were rearranged depending on the results of the pre-application. The data obtained as a result of the application were divided into two, and the second and third study groups of the research were formed. The structure of the scale developed in the second study group was determined by EFA. According to EFA results, it was seen that the scale had a structure consisting of four factors (dimensions) and 36 items: emotional support (10 items), instructional support (5 items), guidance and orientation support (12 items), and problem-solving support (9 items). The structure of the scale was confirmed in the third study group. To obtain information on the reliability of the scale from the measurements in the second and third groups, the combined Cronbach's alpha and composite reliability coefficients were calculated. In addition, the stability coefficient of the scale was determined by test-retest in a fourth study group. Thus, the reliability of the scale was confirmed in three different ways. By making an item analysis of the data in the second and third groups, it was seen that the items in the scale were at a distinctive level. Finally, Pearson product-moment correlation coefficients related to the sub-dimensions of TSSSSS were calculated on this data group, and it was determined that the compatibility and correlation between the dimensions of the scale were high. In summary, all analysis studies show that a valid and reliable scale has been developed that can measure secondary school students' perceptions of teacher support.

Examining the characteristics of the scales developed for teacher support in the literature may enable us to see the differences, strengths, and weaknesses of the Teacher Support Scale for Secondary School Students (TSSSSS) from these scales. In this context, it would be appropriate to examine the scales developed in this regard, which first consider teacher support as a dimension of social support. The Social Support Scale for Children (SSSC) developed by Harter (1985, 2012) and the Child and Adolescent Social Support Scale (CASSS) developed by Malecki et al. (1999) aim to reveal the social support that students receive from their parents, teachers, classmates, and close friends based on their perceptions. The Perceived Social Support Scale (PSSS) developed by Yıldırım (1997) also includes social support from relatives and society. The aforementioned scales differ from the Teacher Support Scale for Secondary School Students (TSSSSS) that we developed with the current research in that it provides other people and groups who provide social support other than the teacher. Since teacher support is designed as a sub-dimension of the social support scale, limited information about support is obtained. Again, although the scales give information about the social support provided by the teacher, they do not reveal the type of support.

One of the tools that indirectly measures teacher support outside the context of social support is Pianta et al. (2008) is the Classroom Assessment Scoring System (CLASS). The scale developed to measure teacher-student interaction has a three-dimensional structure: emotional support, classroom organization, and instructional support. Although the scale has the emotional and instructional dimensions of teacher support, it does not include the types of support that the student may need in the school environment, such as teacher guidance and orientation, or problem solving. Johnson et al. (1983), the Classroom Life Instrument, focuses more on the classroom climate and learning environment, but also provides limited information about the personal and academic support of the teacher. The fact that the Teacher Support Scale for Secondary School Students (TSSSSS) that we developed with the current research has dimensions such as guidance and orientation, and problem solving provides an advantage in terms of giving the teacher's support, or, in other words, the role of the teacher in creating a positive classroom climate.

In the literature, there are also scales developed to measure teacher support directly, not under social support or other concepts. The psychometric properties of the Teacher Support Scale (TSS), developed by McWhiter (1996) to determine students' perceptions of their teachers' supportive behaviors, were examined by Metheny, McWhirter, O'Neil (2008) and the factor structure of the scale was determined as follows: positive regard, invested, expectations, and accessible. The scale provides information about the teacher's involvement with the students, helping the students for their future success, having positive expectations about their academic success, and the students' accessibility to the teacher. On the other hand, the scale does not provide information about whether the teacher helps the students with problems. Torsheim et al. (2000), the four-item teacher support dimension of the Teacher and Classmate Support Scale is to reveal students' perceptions on issues such as the teacher treating students fairly, helping students when they need it, taking care of their students, and being nice and friendly towards them. Due to the small number of items in the teacher support dimension, limited information is obtained about the support and the type of support.

In the literature, there are also scales that measure the support offered by the teacher, based on the behavior of the teacher towards his students in more specific situations and issues. In the Perceived Teacher Support of Questioning Scale (PTSQ), developed by Karabenick and Sharma (1994), students' perceptions of support are tried to be deduced based on how teachers respond to other students as well as to themselves when their teachers are teaching or explaining something in the classroom. The scale reveals student perceptions of the teacher giving specific instructions to students on how to behave when they have questions, providing opportunities to ask questions during lectures or explanations, providing informative or procedural answers to questions, operating the reward-punishment system, giving emotional responses to student questions, and valuing asking questions in the classroom. The scale is limited to revealing the teacher's support through the students' responses to their questions during instruction. Zhang et al. (2021) developed the Career-Related Teacher Support Scale based on social support theory to measure the extent to which teachers support students' career development. The scale consists of three dimensions: enhancement of self-exploration, informational support, and emotional support. The enhancement of self-exploration means that teachers help students in their career planning to identify their own strengths and weaknesses, discover interests, and determine the relevance of job characteristics to them. Informational support means that teachers provide information to students about the requirements of the workplace, the job market, and employment prospects, and emotional support means that they believe in and encourage them to have a good future and career. Although the scale has some of the dimensions of social support, it has a very specific use in that it is career-based. For the subject of student bullying, which is also a special case, the Student Experience Teacher Support Scale (SETS) was developed by Nelson et al. (2019). The scale, which consists of two dimensions (experience and heard), is used to predict the degree to which students experience teacher support when exposed to aggression and bullying. The scales in

question have a very different structure and purpose from the Teacher Support Scale for Secondary School Students (TSSSSS) in terms of measuring the type and level of support that the teacher provides to his students in more specific situations and issues.

It is thought that the TSSSSS developed with the idea that "the developmental characteristics of the students differ according to the educational levels, which will also affect the type and quality of the support that will be provided to them". Thanks to this scale, an idea can be obtained about determining the areas in which secondary school students need support and what to do to meet these needs. There may be an improvement in the subjective and psychological well-being levels of students who are supported by their teachers in meeting their needs. Because adolescents' subjective well-being is related to their various school experiences, especially their perceptions of teacher support (Suldo et al., 2009). Teacher support can help students reduce psychological problems such as academic stress, depression, and burnout. Another benefit of teacher support is that it is also related to the academic emotions of the student (Lei, Cui, & Chiu, 2018). It can be thought that the studies to be carried out to increase teacher support will also reflect on the academic success of the students. The fact that the scale provides information on the way or purpose of teacher support may enable us to see the effect of the type of support on the variables associated with it in future studies. The development of the scale in Turkish is also very important in terms of helping to eliminate an important deficiency in the literature and evaluating the results in the context of Turkey.

In addition to these strengths, TSSSSS also has some limitations. As a result of EFA, 10 items that did not fit with the theoretical structure had to be removed from the instructional support dimension. Although the condition of having at least two items for a dimension (Durmuş et al., 2011) was met, there was a limitation in the dimension in terms of content validity. The type of support that the teacher can offer for student learning cannot be limited to these five items. Items in this dimension do not include types of teacher support such as motivating students to be successful, encouraging student participation, or fostering autonomy in the lesson. The reason for the elimination of these items from the scale may be due to the time of application of the scale. After the COVID-19 epidemic, the priority of teachers is to focus on the psychological adaptation of students to school rather than teaching. This situation may have been caused by the teachers' limited instructional support or not being perceived adequately by the students. On the other hand, the preparation of the scale items based only on the literature may also have limited the type of support. On the subject, information about different types of support could be obtained beforehand through qualitative interviews with students, and articles could be written about them. Again, it could be possible to design a second-level CFA by designing another support type or types other than problem-solving support for extraordinary situations. Despite all these limitations, TSSSSS is a valid and reliable scale that can measure secondary school students' perceptions of teacher support. The findings to be obtained as a result of the application of TSSSSS to different sample groups are important in terms of contributing to the measurement power of the scale. However, considering the limitations of the scale, developing a separate scale to support student learning and success in the future may help us obtain detailed information on this subject.

Author (s) Contribution Rate

Both researchers contributed at every stage of the research.

Conflicts of Interest

There are no conflicts of interest.

Ethical Approval

Ethical Approval Ethical Permission (14/01/2022-E-77082166-604.01.02-263897) was obtained from Gazi University for this research.

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Appendix 1. Teacher Support Scale for Secondary School Students (Turkish Version)

	Bu okuldaki öğretmenler,	Kesinlikle katılmıyorum	Katılmıyorum	Kısmen Katılmıyorum	Kısmen Katılıyorum	Katılıyorum	Kesinlikle katılıyorum
1	Öğrencilerine güvenir.	(1)	(2)	(3)	(4)	(5)	(6)
2	Öğrencilerine karşı sevgi doludur.	(1)	(2)	(3)	(4)	(5)	(6)
3	Öğrencilerine karşı açık ve dürüsttür.	(1)	(2)	(3)	(4)	(5)	(6)
4	Öğrencilerine karşı saygılıdır.	(1)	(2)	(3)	(4)	(5)	(6)
5	Öğrencilerine karşı anlayışlıdır.	(1)	(2)	(3)	(4)	(5)	(6)
6	Karşısındaki öğrenciye önyargı ile yaklaşmaz.	(1)	(2)	(3)	(4)	(5)	(6)
7	Öğrencileriyle konuşurken dikkatini onlara verir.	(1)	(2)	(3)	(4)	(5)	(6)
8	Öğrencileriyle ilgilenir.	(1)	(2)	(3)	(4)	(5)	(6)
9	Öğrencilerinin başarılı olabileceğine inanır.	(1)	(2)	(3)	(4)	(5)	(6)
10	Öğrencilerine karşı güler yüzlüdür.	(1)	(2)	(3)	(4)	(5)	(6)
11	Ders esnasında anlaşılmayan bir konuyu istememiz halinde tekrar anlatır.	(1)	(2)	(3)	(4)	(5)	(6)
12	Ders esnasında anlatılan konuyla ilgili bir sorumuz olursa bunu çekinmeden sorabileceğimizi söyler.	(1)	(2)	(3)	(4)	(5)	(6)
13	Bir işin (örneğin, etkinliğin, ödevin vb.) nasıl yapılması gerektiği konusunda açıklama yapar.	(1)	(2)	(3)	(4)	(5)	(6)
14	Bir işin nasıl yapılması gerektiğini gösterir.	(1)	(2)	(3)	(4)	(5)	(6)
15	Ders esnasında yanımıza gelerek yaptığımız işin doğru olup olmadığını kontrol eder.	(1)	(2)	(3)	(4)	(5)	(6)
16	Günlük yaşantımızda bizim için yararlı olacak bilgiler verir.	(1)	(2)	(3)	(4)	(5)	(6)
17	İyi bir insan olarak yetişmemiz için bize tavsiyelerde bulunur.	(1)	(2)	(3)	(4)	(5)	(6)
18	Sağlıklı bir birey olarak yetişmemiz için edinmemiz gereken alışkanlıklar konusunda bize tavsiyelerde bulunur. (Örneğin, hijyen, beslenme, uyku vb.)	(1)	(2)	(3)	(4)	(5)	(6)
19	Duygu ve düşüncelerimizi nasıl ifade edebileceğimiz konusunda bizi bilgilendirir.	(1)	(2)	(3)	(4)	(5)	(6)
20	Arkadaşlarımıza nasıl davranmamız gerektiği konusunda tavsiyelerde bulunur.	(1)	(2)	(3)	(4)	(5)	(6)
21	Başarılı olmamız için nasıl çalışmamız konusunda tavsiyelerde bulunur.	(1)	(2)	(3)	(4)	(5)	(6)
22	Hedeflerimizi belirlerken nelere dikkat etmemiz konusunda bizi bilgilendirir.	(1)	(2)	(3)	(4)	(5)	(6)
23	Belirlediğimiz hedeflere nasıl ulaşabileceğimiz konusunda bize yol gösterir.	(1)	(2)	(3)	(4)	(5)	(6)
24	Kişisel sorunlarımızı çözebilmemiz için nasıl bir yol izlememiz gerektiği konusunda bizi bilgilendirir.	(1)	(2)	(3)	(4)	(5)	(6)
25	Hedeflerimize ulaşmamız için bizi cesaretlendirir.	(1)	(2)	(3)	(4)	(5)	(6)

26	Hedeflerimize ulaşabileceğimize inanır.	(1)	(2)	(3)	(4)	(5)	(6)
27	Başarı durumumuzu takip eder.	(1)	(2)	(3)	(4)	(5)	(6)
28	Bir sorunumuz olduğunda bizi dinler.	(1)	(2)	(3)	(4)	(5)	(6)
29	Bir sorunumuz olduğunda sorunun çözümü için yardımcı olur.	(1)	(2)	(3)	(4)	(5)	(6)
30	Kavga eden öğrenciler varsa onları ayırır.	(1)	(2)	(3)	(4)	(5)	(6)
31	Birisine kötü davranıldığını görürse bunu yapan(lar)a müdahale eder.	(1)	(2)	(3)	(4)	(5)	(6)
32	Birisi kendini kötü hissederse onu rahatlamaya çalışır.	(1)	(2)	(3)	(4)	(5)	(6)
33	Birisi öfkelendiğinde onu sakinleştirir.	(1)	(2)	(3)	(4)	(5)	(6)
34	İhtiyaç duyduğumuz bir bilgiyi sağlar.	(1)	(2)	(3)	(4)	(5)	(6)
35	İhtiyaç duyduğumuz bir bilgiye sahip olmasa bile o bilgiye ulaşmak için bize yardımcı olur.	(1)	(2)	(3)	(4)	(5)	(6)
36	İhtiyacımız olan bir şeyi elde etmemizde bize yardımcı olur.	(1)	(2)	(3)	(4)	(5)	(6)

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Investigation of Student and Teacher Characteristics Associated with Mathematics Achievement in the Transition to Secondary Education Exam

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Investigation of Student and Teacher Characteristics Associated with Mathematics Achievement in the Transition to Secondary Education Exam

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Abstract

The purpose of this study is to examine student and teacher characteristics related to students' mathematics achievement. The study group for this research was composed of 1533 students who participated in the mathematics subtest of the transition from basic education to secondary education applied in 2016 and 36 mathematics teachers who teach these students. The data for the research are collected with the prepared student and teacher questionnaires. In the analysis of the data, two-level hierarchical linear models are used. According to the results, the most important teacher characteristic related to students' mathematics achievement is the level of professional satisfaction of the teacher. In addition, teachers' seniority, main field education, and classroom management skills have a significant and positive effect on mathematics achievement. Also, teachers' participation in professional development activities has a significant and negative effect on mathematics achievement, but this effect is small in practice. At the student level, the student's self-confidence in mathematics has the most important effect on the subject's achievement. The variables of students' liking mathematics and their anxiety towards mathematics have negative and significant effects on mathematics achievement, but these effects are small in practice.

Keywords: Mathematics achievement, Secondary education transition exams, HLM, Teacher characteristics, Student characteristics

Introduction

The general purposes of education systems are improved according to the needs of individuals and society. Although there are differences among countries, the general purposes are to raise productive and well-equipped individuals who can adapt to developing and changing situations, are researchers, have a healthy character that can make both themselves and the society happy, and are respectful of the beliefs, thoughts, and differences of others.

Education systems are composed of stages. These stages are broadly classified as pre-school, basic, secondary, and higher education. Each country prefers different policies for the transition from basic education to secondary education. For example, in countries such as China, South Korea, the Netherlands, and the USA, transitions to secondary education institutions are based on central examinations, while in countries such as Germany and Finland, teacher evaluations or student grades are taken as the basis for the transition to secondary education (Gür, Çelik, & Coşkun, 2013).

In Turkey, the transition to secondary education examination has been administered for years. The scope of these exams varies within the framework of different policies. MEB stated that the general purpose of the changes is to reduce stress in students and parents and to increase the importance given to school education (MEB, 2007; MEB, 2013). The fact that the schools that choose their students with high scores in the transition exams have a high rate of university transition increased the importance given to these exams and caused these exams to be seen as the key to a good future.

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Secondary Education Transition Exams in Turkey

With the institution of the colleges in Turkey in 1955, some secondary education institutions started to admit students by examination (Gür et al., 2013). After this date, central examination systems are needed due to the increasing interest in secondary education institutions providing quality education and the limited quotas of these schools. With the eight-year compulsory education law on August 18, 1997, basic and secondary schools were merged and renamed as primary education. After this date, the High School Entrance Examination was started to be administered for students who wanted to transfer from primary education to secondary education institutions such as Anatolian and Science High Schools. There were also different exams, such as private high school exams and police college exams.

LGS, which was applied between 1998 and 2004, was abolished in order to combine all exams under a single exam, and the Secondary Education Institutions Selection and Placement Exam (OKS) began to be applied instead of this exam (Gür et al., 2013). OKS, which was applied between 2004 and 2007, was abolished on the grounds that students were under great stress and the scope of the exam was not sufficient. In 2008, SBS (Level Determination Exams) started to be implemented within the scope of the Transition System for Secondary Education Institutions (OGES). OGES was put into practice as a student-focused system consisting of three main elements by combining the scores of the students in the SBS applied at the end of the 6th, 7th, and 8th grades, the school achievement scores of the students, and the behavioral scores of the students (MEB, 2007). However, in this system, the 6th and 7th grade SBS applications were abolished in 2010 due to the fact that it was harmful for students to meet the central exam at a young age, and the 8th grade SBS application was continued (MEB, 2010).

After the single-stage SBS between 2010 and 2013, Transition System from Basic Education to Secondary Education (TEOG) started to be administered. It had been stated that the purpose of this exam was to reduce the stress of the students by spreading the exams throughout the process and to provide the students with the opportunity to make up for the exams they could not take (MEB, 2013). TEOG exams were also not very long-term, and they were abolished in 2018 and replaced by the LGS (High School Entrance System). In this new system, which is still applied today, the number of secondary education institutions that take their students via exams has decreased, and schools selected from every type of school (Science, Anatolian, Social sciences, Vocational high schools, and project schools, etc.) in every province started to admit students with this exam (MEB, 2018).

There is a need for central examination systems in our country due to the high population of young people and the low number of high schools providing quality education. As mentioned above, many different exam systems have been administered since 1997. Especially in the last two decades, the content and scope of the centrally administered examination systems have undergone many changes within the framework of different reasons and policies, and stability has not been achieved.

Yavuz, Odabaş, and Özdemir (2016) investigated the relationship between students' socioeconomic levels and TEOG mathematics achievement using the Hierarchical Linear Model. It has been found that schools vary significantly from each other in terms of mathematics achievement, and SES does not have a significant effect on students' mathematics achievement. Yıldız (2015) examined the relationship between students' metacognitive awareness, academic self-efficacy levels, motivational beliefs, and TEOG Turkish scores using a structural equation model. According to the results of the research, it has been found that the most important variable affecting the TEOG Turkish score is academic self-efficacy. Süer (2014) examined the relationship between TEOG score and students' self-regulation skills, gender, going to a private teaching school, and socioeconomic levels. It has been concluded that students who go to private teaching institutions and who have a high socioeconomic level are more successful. The variables of self-efficacy and anxiety level are related to the TEOG score, while the variables of self-regulation and intrinsic value are not related to the TEOG score of the students. Genç (2020) examined the effect of non-routine problem-solving education on strategic flexibility and LGS success. There is a positive and moderately significant relationship between the strategic flexibility score and LGS mathematics achievement. However, although the given training made a difference in the LGS math scores of the experimental group students compared to the control group, there is no significant difference between the two groups. Yıldız (2021) investigated the effect of panic levels on academic achievement when students' communication with smart phones was cut off. According to the results obtained, the nomophobia sub-factor scores differed according to the LGS scores. Kılıç (2022) found that students who take private lessons and think that they have enough family support are more successful in LGS. While it is seen that there is a positive and moderately significant relationship between attitudes towards mathematics and LGS scores, there is no relationship between motivation level and LGS scores.

Mathematics Achievement

Increasing the mathematics achievement of a society is very important for individuals to have stronger foundations in lifelong learning skills and to gain analytical thinking ability (Bloom, 1998). Therefore, great efforts are made to improve and develop students' mathematics achievement at all levels of education. Man is a social being and interacts with his environment. Therefore, the focus of researchers should be to examine the factors associated with mathematics achievement and to understand how these factors can be used to improve achievement (Miller, 1991). Variables associated with mathematics achievement may be related to individual characteristics as well as family, peer group, teacher, and school characteristics (Petty, Wang, & Harbaugh, 2013). The purpose of this study is to examine the student and teacher characteristics associated with mathematics achievement; therefore, the characteristics associated with mathematics achievement are examined under the title of teacher and student characteristics.

Teacher Characteristics

Teachers have a great responsibility in the realization of education and training purposes (Büyükkaragöz, 1998). Therefore, it is extremely important to investigate the qualifications and competencies that effective teachers should have and to carry out the necessary studies to develop these characteristics (Goe, 2007). According to Rogers (1979), the characteristics that effective teachers should have are accepting students, reinforcing students' positive behaviors, having an empathetic understanding, and having self-confidence. According to Perrot (1984), effective teachers plan the lesson well, explain the lesson effectively and efficiently, involve the students in the lesson by asking questions, and ensure the classroom organization and communication in a healthy way. On the other hand, Liu and Meng (2009) classified the characteristics of effective teachers as teacher ethics, student achievement scores, professional development, and professional skills.

In the learning process, the student and the teacher are in one-to-one interaction. That's why one of the most important variables affecting success is teacher characteristics. In the studies examining the teacher characteristics related to the success of the students, it is seen that the variables examined were the teacher's main field of education, seniority, gender, participation in professional development activities, classroom management skills, and professional satisfaction (Ashton & Crocker, 1987; Cohen & Hill, 1977; Greenwald, Hedges & Laine, 1996; Lamb & Fullarton, 2002; Murnane & Phillips, 1981; Opdenakker & Damme, 2006; Wiley & Yoon, 1995; Zuzovsky, 2009;).

Student Characteristics

There are many variables that affect mathematics achievement. Some of these variables are related to the student's characteristics. Variables such as the student's attitude towards mathematics, anxiety level, desire to learn mathematics, value of mathematics, gender, socioeconomic level, etc. affect the student's mathematics achievement.

According to Hart (1989), mathematics attitude is the tendency to respond to mathematics in a positive or negative way. According to Kay (1993), mathematics attitude includes cognitive, affective, and behavioral domains, and these domains can be exemplified by variables such as self-confidence in mathematics, liking learning mathematics, valuing mathematics, and the usefulness of the mathematics. Reyes (1984) stated that the main variables associated with mathematics achievement are attitude towards mathematics, self-confidence in mathematics learning, and the usefulness of mathematics. Ma and Kishor (1997) stated that there is a significant positive relationship between mathematical attitude and mathematical achievement. Azina and Halimah (2012), Aydın (2015), Akyüz (2014), Kadijevich (2008) found in their studies that there is a significant and positive relationship between mathematics achievement and self-confidence.

Sheffield and Hunt (2006) define math anxiety as the fear and anxiety that occur in students when faced with mathematical problems. Şentürk (2010), Yenilmez and Özabacı (2003), Miller (1991), Ma and Xu (2004), found that there is a negative and significant relationship between anxiety level and mathematics achievement. In addition to the affective characteristics of the students, it has been investigated in the studies that variables such as the time allocated to learning, gender, taking private lessons, and the education level aimed at by the student are associated with mathematics achievement (Gainer, 1962; Özer & Anıl, 2011; Petty et al., 2013; Yılmaz & Hanci, 2016).
Factors affecting mathematics achievement may arise from the student himself as well as from the characteristics of the teacher and school. Analyzing the variables affecting achievement according to these

levels will provide a more effective explanation of the factors affecting success. Classical regression analyses consider the variables as a whole and do not allow analysis according to their levels. Hierarchical Linear Models, on the other hand, provide the opportunity to analyze the variables according to their levels by eliminating this deficiency of classical regression analysis. Therefore, in this study, variables affecting mathematics achievement are analyzed with Hierarchical Linear Models.

Hierarchical Linear Models

As a social being, the human interacts with his environment and tends to be in groups with similar characteristics. For this reason, research data obtained in the fields of social sciences is generally organized in a hierarchical structure. That is, the data subject to the research can be classified within groups with the same characteristics. Hierarchical linear models, which are expressed in different terms in the literature such as Nested Model, Multilevel Model, Covariance Component Model, Mixed Linear Modeling or Progressive Linear Model, are widely used in many different fields such as education, social sciences, health, and economy. With these models, analyses can be carried out at the individual level, and intergroup relations and differences can be examined flexibly (Raudenbush & Bryk, 2002).

Behaviors and characteristics of individuals are affected by the group characteristics of individuals as well as inherited. Therefore, in studies conducted on individuals, the group characteristics of individuals should also be taken into account. Although it is assumed that the data are independent from each other in classical analysis techniques, analysis should be carried out considering that the group characteristics of the data belonging to the same group are similar and the data are not independent from each other (Raudenbush & Bryk, 2002). For example, the classroom climate, teacher characteristics, and school characteristics are the same for two students in the same class. Therefore, class, teacher, and school characteristics should be included in the student-level analysis.

There are many studies in the literature using hierarchical linear models. In these studies, variables related to achievement are modeled at multiple levels, the characteristics of students, teachers, schools, and regions are included in the models in a flexible way, and comparisons are made across countries (Atar, 2014; Chiu, 2010; Demir & Kılıç, 2010; Kanyongo, Schreiber & Brown, 2007; Karabay, Yıldırım & Güler, 2015; Lamb and Fullarton, 2002; Mohammadpour & Shekarchizadeh, 2013; Petty et al, 2013; Yıldırım, 2012; Yılmaz & Hanci, 2016). In the study, student and teacher characteristics related to mathematics achievement are examined. Students are nested within teachers. That is, the data set of the study has a hierarchical structure. For this reason, Hierarchical Linear Models, which are one of the multi-level analysis methods suitable for the data structure of the research, are used in the study.

Purpose of the Study

The purpose of this study is to investigate student and teacher characteristics related to mathematics achievement. For this purpose, the mathematics scores of the Transition System from Basic Education to Secondary Education (TEOG) are used. A great deal of effort and time is spent on teaching mathematics from preschool to the last step of the education level. However, when the results of the international and national exams are examined, it is seen that the mathematics achievement of the students is very low, and the deficiency cannot be eliminated (MEB, 2015; MEB, 2016; MEB, 2016b). The reasons why students fail in mathematics may be due to student or environmental characteristics. When the literature is examined, it is seen that the data from international exams (such as PISA and TIMSS) are generally used in studies examining the effects of student and teacher characteristics on achievement, and there is not much study about the transition exams from basic education to secondary education, which are administered in our country and affect the future of students. It is thought that this study will contribute to the determination of the characteristics that affect achievement in the transition exams from basic education to secondary education, which are applied in our country and where important decisions are taken with their results. Investigating the variables that are affecting mathematics achievement with the Hierarchical Linear Model at the student and teacher level will provide more detailed information about the effects of these variables. For this purpose, answers to the following questions are investigated in the study:

1- Is there a difference among teachers in terms of mathematics achievement in the secondary education transition exam?

2- What are the teacher characteristics that affect the mathematics achievement in the secondary education transition exam?

3- What are the affective characteristics of the students that affect their mathematics achievement in the secondary education transition exam?

Method

Research Model

The purpose of this research is to examine the relationship between students' mathematics achievement and student and teacher characteristics. Therefore, this study is a correlational one. These studies examine the size and direction of the relationship among variables (Lodico, Spaulding & Voegtle, 2006).

Working Group

The study group for the research consisted of 1533 student (796 boys (50.2%) and 764 girls (49.8%)) 8th grade who participated in the TEOG mathematics subtest administered in November 2016 and 36 mathematics teachers. There are 36 mathematics teachers (14 men (38.9%) and 22 women (61.1%)) who participated in the research.

Data Collection Tools

The data for the study were collected with student and teacher questionnaires prepared by the researchers. The scales of self-confidence in mathematics, mathematics anxiety, engagement in learning mathematics, and valuing mathematics were taken from the TIMSS 2011 student questionnaire, and the teachers' professional satisfaction scale was taken from the TIMSS 2011 teacher questionnaire. TIMSS questionnaires, a project of the IEA, are developed by experts, and necessary scale development, pilot applications, and item analyses are carried out in detail (Martin & Mullis, 2012).

The affective characteristics of the students were obtained from the student questionnaire. These variables are the student's level of anxiety towards mathematics, self-confidence toward mathematics, desire to learn mathematics, engagement in learning mathematics, and value of mathematics.

The prepared teacher questionnaires were applied to the mathematics teachers who teach the students in the study group. The teacher's seniority year, participation in professional development activities, professional satisfaction level, main field education, and classroom management skills were obtained from teacher questionnaires.

In this study, mathematics achievement scores obtained from the 1st session of the Transition Exam from Basic Education to Secondary Education (TEOG) were used as the dependent variable. TEOG exams were administered twice a year, in November for the first semester and for April in the second semester and consisted of six subtests. These were Mathematics, Turkish, Science, Foreign Language, Religious Culture and Moral Knowledge, T.C. History of Revolution and Kemalism domains. There were 20 questions in each subtest (MEB, 2016a). Mathematics scores were calculated by multiplying the number of correct answers in the tests by 5.

Table 1. Descriptive findings of student and teacher level variables

Level 1 Variables	N	Mean	S.D	Max.	Min	Cronbach Alfa
Anxiety	1533	12.76	4.96	5	25	0.84
Self-confidence	1533	26.23	7.34	8	40	0.86
Like Learning	1533	18.32	5.06	5	25	0.82
Engagement	1533	18.42	3.58	5	25	0.60
Value	1533	22.72	5.36	6	30	0.81
Level 2 Variable						
Professional Satisfaction	36	25.33	2.20	20	30	0.73

Analysis of Data

Many social studies show hierarchical data structures, and the levels across hierarchies are interrelated. Classical statistical techniques assume that the data are independent. School, classroom, and teacher characteristics are assumed to be independent and analyzed according to this assumption. However, it is obvious that the characteristics of the class belong to every student in the class and that these data are not independent. Therefore, it is recommended to use hierarchical linear models in the analysis of nested data (Raudenbush & Bryk, 2002).

In the study, student and teacher characteristics related to mathematics achievement are examined. Students are nested within teachers. That is, the data set of the study has a hierarchical structure. For this reason, Hierarchical Linear Models, which are one of the multi-level analysis methods suitable for the data structure of the research, are used in the study. Random Effects One Way ANOVA Model, Random Coefficients Regression Model and Mean-as-Outcomes Model are used in the analysis of the data.

Random Effects One Way ANOVA Model

The Random Effects ANOVA Model is the simplest model among the Hierarchical Linear Models. This model is also known as the empty model. It does not contain any independent variables at levels 1 or 2. Hierarchical Linear Models begin with the Random Effects ANOVA Model. The purpose of this model is to separate the variance in the dependent variable according to different levels of the hierarchy (Raudenbush & Bryk, 2002).

Random Coefficients Regression Model

Random Coefficients Regression Model is used when the dependent variable is estimated by level 1 independent variables. That is, it is used to determine which level 1 variables are thought to have an effect on the dependent variable (Raudenbush & Bryk, 2002). With this model, student characteristics related to mathematics achievement are examined. In the Random Coefficients Regression Model, which includes student characteristics at level 1, none of the independent variables are included at level 2 (Raudenbush & Bryk, 2002).

Means-as-Outcomes Models

Means-as-Outcomes Models are used when the dependent variable is estimated by level 2 independent variables. That is, it is used to determine what level 2 variables are thought to have an effect on the dependent variable. While the level 1 equation of this model is set up as in the Random Effects ANOVA Model, the level 2 equation is formed by adding the variables that are thought to have an effect on the dependent variable (Raudenbush & Bryk, 2002). With this model, teacher characteristics associated with students' mathematics achievement are examined. While no student characteristics are added in level 1, teacher characteristics are added in level 2 (Raudenbush & Bryk, 2002).

Because of the large sample size, although independent variables have small effects on dependent variables, they can still produce statistically significant results (Fishman & Galguera, 2003). Therefore, the sizes of the effects of the independent variables are also calculated in the study. Effect sizes are allowing comparisons between different metrics. Effect sizes are calculated by dividing the gamma coefficients of the independent variables by the standard deviation among or within the unconditional model (Von Secker & Lissitz, 1999). If the effect sizes of the variables are 0.5 and more, they are interpreted as large; between 0.5 and 0.3 as moderate; between 0.3 and 0.1 as small; and less than 0.1 as trivial (Rosenthal & Rosnow, 1984).

After the analysis, HLM assumptions are checked. Independence of errors, homogeneity of variances, and normality assumptions are met. In order to correctly interpret the slope and intersegments coefficients estimated by the HLM models, the variables whose zero value is not significant should be centered (Raudenbush & Bryk, 2002). In this study, level 1 variables with non-significant zero values are centered around the group mean, and level 2 variables are centered around the general mean. Analyses are carried out using the HLM 7 program (Raudenbush & Bryk, 2002). SPSS package programs are used to organize the data.

Results

Results for the 1st Sub-problem

A Random Effect ANOVA Model is used to answer the question "Is there a difference among teachers in terms of mathematics achievement in secondary education transition exam?" Table 2 shows the results.

Table 2. Results of Random Effect ANOVA Model

Fixed Effect	*Coefficient*	*S.E*	*t-ratio*
Average mathematics Achievement γ_{00}	51.03	1.99	25.95***
Random Effect	*Sd*	*Variance*	χ^2
Teacher Level u_{ij}	11.03	121.59	363.60***
Student Level r_{ij}	22.63	512.30	

* p < .05; ** p < .01; *** p < .001

The general mathematics achievement mean of the students is ranged from 47.18 to 54.87 (51.03±1.96(1.99)) with 95% probability. In addition, the general mathematics achievement average among teachers is ranged from 29.43 to 72.62 (51.03±1.96(11.03)1/2) with 95% probability. This value shows that the average mathematics achievement among teachers is in a wide range. Also, students' overall mathematics achievement has been found to significantly vary among teachers (p < .001). That is, there are significant differences among teachers in terms of students' mathematics achievement. Interclass correlation is calculated as 0.19 (ρ=121.59/ (512.30+121.59)). That is, 19% of the differences in mathematics achievement are due to differences among teachers and 81% to individual differences among students.

Results for the 2nd Sub-problem

The Means-as-Outcomes Regression Model is used to answer the question, "What are the teacher characteristics that affect the mathematics achievement in the secondary education transition exam?" For this purpose, the year of seniority (seniority), the teacher's main field of education (education), participation in professional development activities (professional development), the level of professional satisfaction (professional satisfaction), and classroom management skills (classroom management) are added to the analysis. Table 3 shows the results.

Table 3. Results of Means-as-Outcomes Regression Model

Fixed Effect	Coefficient	S.E	t-ratio	Effect Size
Average Mathematics γ_{00}	50.54	1.22	41.53***	
Seniority γ_{01}	5.39	1.63	3.32***	0.49
Education γ_{02}	4.13	1.74	2.37*	0.37
Professional Development γ_{03}	-1.74	0.76	-2.30*	-0.16
Classroom Management γ_{04}	5.11	2.12	2.42*	0.46
Professional Satisfaction γ_{05}	6.50	1.39	4.68***	0.59
Random Effect	Sd.	Variance	χ^2	
Teacher Level u_{ij}	6.00	36.02	116.94***	
Student Level r_{ij}	22.63	512.16		

* p < .05; ** p < .01; *** p < .001

Table 4 shows that the teacher's seniority, main field education, classroom management, and professional satisfaction level have a significant and positive effect on mathematics achievement. Students of teachers who have high seniority, graduated from education faculties, are good at classroom management, and have high professional satisfaction are more successful in mathematics. In addition, it can be stated that the most important teacher characteristic related to mathematics achievement is the satisfaction level of the teacher. There is a negative and significant relationship between the number of teachers participating in professional development activities in the last two years and the mathematics achievement of the students.

When the effect sizes of teacher characteristics are examined, an increase of 1 standard deviation in a teacher's seniority, education, classroom management, and professional satisfaction will provide an increase of 0.49, 0.37, 0.46 and 0.59 standard deviations in mathematics achievement, respectively. The effect sizes of these variables are moderate. An increase of 1 standard deviation in participation in professional development activities will cause a 0.16 standard deviation decrease in mathematics achievement. However, this effect has been found to be insignificant in practice. Adding teacher characteristics to the Means-as-Outcomes Regression Model decreased the among-teacher variability variance from 121.59 to 36.01. It is established that the level 2 variables explain 71% of the variance among teachers in mathematics achievement.

Results for the 3rd Sub-problem

Random Coefficients Regression Model is used to answer the question "What are the affective characteristics of the students that affect the mathematics achievement in the secondary education transition exam?". For this purpose, anxiety in mathematics, self-confidence in mathematics, liking learning mathematics (like learning), engagement in learning mathematics (interest), and valuing mathematics (value) variables are added to the Random Coefficients Regression Model as level 1 predictors.

Table 4. Results of Random Coefficients Regression Model

Fixed Effect	Coefficient	S.E	t-ratio	Effect Size
Average Mathematics γ_{00}	47.44	2.32	20.44***	
Valuing Mathematic γ_{10}	0.16	0.79	0.20	
Anxiety in mathematics γ_{20}	-3.34	0.62	-5.38***	-0.15
Self-confidence in mathematics γ_{30}	13.40	1.03	12.97***	0.60
Like Learning Mathematics γ_{40}	-2.89	0.80	-3.60***	-0.12
Engagement in Mathematics γ_{50}	1.11	0.91	1.22	
Random Effect	Sd.	Variance	χ^2	
Teacher Level u_{ij}	10.70	114.55	750.82***	
Self-confidence u_{3j}	1.40	1.96	36.08*	
Student Level r_{ij}	17.07	291.38		

* p < .05; ** p < .01; *** p < .001

According to the results of the analysis, the relationship between the value given to mathematics and the interest in mathematics variables and mathematics achievement was not found to be significant. In other words, there is no significant relationship between the student's value and interest in mathematics and his or her mathematics achievement.

It has been found that there is a negative and significant relationship between the student's anxiety level and their likeliness to learn mathematics and mathematics achievement. When other variables are fixed, a one standard deviation increase in the student's anxiety level and the variables like learning mathematics will decrease the mathematics achievement by 0.15 and 0.12 standard deviations, respectively. However, the size of the effect of both variables is found to be minimal in practice.

It is found that there is a significant and positive relationship between student's level of self-confidence in the mathematics and mathematics achievement. When other student affective characteristics added to the model are fixed, a one standard deviation increase in students' self-confidence will increase their mathematics scores by 0.6 standard deviations, and this effect size is important in practice. In addition, the most important variable affecting mathematics achievement at the student level is self-confidence. In addition, when the random effect values are examined, the random effect on the slope of the self-confidence variable is significant (p<.05). In other words, effect of the self-confidence on mathematics achievement varies across the population of teachers. Adding student characteristics to the Random Coefficients Regression Model decreased the teacher variability variance from 512.30 to 291.38. It is established that the level 1 variables explain 43percent of the variance in students' mathematics achievement.

Conclusion and Discussion

According to the results of the research, 19% of the variances in mathematics achievement are due to the differences among teachers, and this difference is found to be statistically significant. The year of seniority, main field education, participation in professional development activities, the level of professional satisfaction, and classroom management skills variables explain 71% of the variance among teachers in mathematics achievement. At the student level, approximately 43% of the variance in students' mathematics achievement is explained by the variables of the student's level of anxiety towards the mathematics, the level of self-confidence in the mathematics, like learning mathematics, the valuing mathematics and the student's engagement in learning mathematics.

Teacher Characteristics

An outcome of the research is that the seniority of the teacher has a significant and positive effect on mathematics achievement, and the size of this effect is moderate. There are many studies investigating the relationship between a teacher's seniority and achievement. Murnane and Philips (1981), Greenwald et al. (1996), found in their studies that there is a significant and positive relationship between achievement and teachers' seniority. While there may be a positive relationship between seniority and achievement, there are studies that determine that there is no or a negative relationship (Akyüz, 2006; Lamb & Fullarton, 2002; Zuzovsky, 2009). In addition, in some studies, it has been stated that the relationship between seniority and success disappeared within three or four years (Rivkin, Hanushek, & Kain, 2005).

An outcome of the research is that teachers' main field education has a significant and positive effect on mathematics achievement, and the size of this effect is moderate. Accordingly, the more the main field of education of teachers is related to mathematics and educational sciences, the higher the mathematics achievement of the students. There are studies showing that there are strong positive relationships between education programs and teacher effectiveness (Ashton & Crocker, 1987; Evertson, Hawley & Zlotnik, 1985; Ferguson & Womack, 1993; Guyton & Farokhi, 1987). Monk (1994) found that there is a positive correlation between students' science and mathematics achievements and teachers' pedagogical education. Begle (1979) found that there is a strong relationship between students' mathematics performance and teachers' mathematics education. There are also studies that show that there is no relationship between main field education and achievement (Goldhaber & Brewer, 2000; Perkes, 1967-1968) or that there is a negative relationship (Zuzovsky, 2009).

According to the results of the study, there is a negative and significant relationship between the number of teachers participating in professional development activities in the last two years and students' mathematics achievement, but the size of this effect is small in practice. Professional development activities can help teachers update their field knowledge and learn new techniques in the field of education and training. Some of the professional development activities are mandatory for candidate teachers (MEB, 2017). This result may be due to the compulsory participation of newly appointed teachers. The relationship between participation in professional development activities and success is not fixed. Jacob & Lefgren (2004) have stated that there isn't a significant relationship between student achievement and teachers' participation in professional development activities. Contrary to this study, Cohen and Hill (1977), Wiley and Yoon (1995), and Brown, Smith and Stein (1995) determined that there is a significant and positive relationship between students' mathematics achievement and teachers' participation in professional development activities.

An outcome of the research is that teacher's classroom management skills have a significant and positive effect on mathematics achievement, and the size of this effect is moderate. Classroom management skills are a property that varies from teacher to teacher. Classes that do not have an effective teaching-learning environment distract students and teachers, which can lead to inefficient teaching. The fact that the teacher's classroom management skills are high indicates that the teacher creates a quiet and orderly working environment in their classrooms; there is no problem maintaining order and keeping students under control (Opdenakker & Damme, 2006). Therefore, it is extremely important for teachers to have classroom management skills. Studies in the literature have found that there is a significant relationship between class management skill and achievement (Akyüz, 2006; Opdenakker & Damme, 2006) or that there is no relationship (Akyüz, 2006).

According to the outcomes of the research, teachers' professional satisfaction levels have a significant and positive effect on mathematics achievement. In addition, when the effect size of this variable is examined, the most important teacher characteristic affecting the average mathematics achievement is the level of professional

satisfaction of the teacher. Şahin (2013) stated that teachers experience job dissatisfaction in terms of management and wages. On the other hand, it can be said that the professional satisfaction levels of teachers have decreased due to reasons such as decreased respect for the teaching profession, increased daily lesson hours, and frequent school discipline problems. There are many studies examining the relationship between the level of professional satisfaction and success. Opdanakker and Damme (2006) and Aktaş (2011) have stated that there is a significant and positive relationship between teachers' levels of professional satisfaction and success, while Atar (2014) stated that there is practically no significant relationship between the level of professional satisfaction and achievement.

Student Characteristics

According to the results of the study, the student's engagement in learning mathematics and valuing mathematics doesn't have a significant effect on mathematics achievement. Valuing mathematics refers to students' attitudes towards the importance of mathematics and its usefulness in various periods of their lives (Wigfield & Eccles, 2000). Kim et al. (2013) found that there is no significant relationship between valuing mathematics and student achievement in Finland, while there is a significant relationship in Singapore and Korea. Arıkan, van de Vijver & Yağmur (2016) conducted a study using TIMSS 2007 and 2011 data and found that there is no significant relationship between the value given to mathematics and success. This result can be interpreted as the students' value of mathematics regardless of whether they are successful or unsuccessful, but this is not related to mathematics achievement.

Student engagement is a factor defined as intrinsic interest and the level of student involvement in school. It consists of behaviors such as motivation, persistence, positive learning values, enthusiasm, effort, and interest (Gibbs & Poskitt, 2010). Shernoff & Schmidt (2008) found that student engagement increases achievement. Akyüz (2014) stated that there is a significant positive relationship between engagement in mathematics and success in Turkey and America, and a negative significant relationship in Singapore and Finland. The view of Simmich-Dudgeon (1996) that students' interest in mathematics is not a self-assessment tool that reflects how good they will be in mathematics is in line with the result of our research.

According to the results of the study, it has been found that there is a negative and significant relationship between the level of student anxiety about the mathematics lesson and mathematics achievement, and the effect size of this variable is small in practice. There are many studies in the literature examining the relationship between students' anxiety levels and academic achievement. Miller (1991), Yenilmez and Özabacı (2003), Ma and Xu (2004), and Şentürk (2010) have found in their studies that there is a negative and significant relationship between students' anxiety level and achievement.

According to the results of the study, there is a negative and significant relationship between the students' likeliness to learn mathematics and their mathematics achievement, but the size of this effect is quite small. Although students do not like mathematics, they can be successful in it to prove themselves to their families, friends, and teachers and to gain an appreciation for the environment. Although they like mathematics, have fun with it, and believe in its necessity, they may fail because they do not make much effort (Öztürk & Şahin, 2015). Kadijevich (2008), using TIMSS 2003 data, found that there is a negative relationship between like learning mathematics and mathematics achievement in 30 countries; Şentürk (2010) found that there is no significant relationship between like learning mathematics and mathematics achievement. Akyüz (2014), using TIMSS 2014 data, found that there is a significant relationship between the variable of liking learning mathematics and success in mathematics in Singapore and the United States, but this relationship is not significant in Turkey and Finland.

Among all affective characteristics included in the analysis, it is seen that the most important variable associated with mathematics achievement is students' self-confidence in mathematics, and the effect size of this variable is quite high. Self-confidence in mathematics is expressed as students' perceptions of difficulty or ease in learning mathematics (Akyüz, 2014). The more students feel that they can learn mathematics and be successful, the more time and effort they will spend to be successful, which will lead the student to success. There are many studies that have found that there are significant relationships between self-confidence and mathematics achievement. Azina and Halimah (2012), Kadijevich (2008), Aydın (2015), Akyüz (2014) found in their studies that there is a significant and positive relationship between mathematics achievement and self-confidence.

Recommendations

This study has some limitations. In the study, the mathematics subtest of the secondary education entrance exam was examined as a dependent variable. Different subtests can be used as dependent variables in further studies. In addition, the variables used in the research are limited to student and teacher characteristics. In future studies, it can be examined in more detail by adding family and peer characteristics related to student achievement. Two-level hierarchical linear models were used in the analysis of the research. For further research, analyses can be made with different methods suitable for the structure of the data; differences or similarities between the methods can be examined in detail; or three-level hierarchical models can be established. Another limitation of the study is that the research group is small. In future studies, analyses can be carried out on larger samples.

In this study, the students with a high anxiety level and low self-confidence in mathematics had lower mathematics achievement. It is recommended to carry out collaborative work with student, teachers, schools, parents, and the ministry in order to decrease the anxiety levels of students towards mathematics and to raise more confident students in the subject. In addition, as in the PISA and TIMSS exams, student, teacher, and school questionnaires can be applied in national exams to determine the affective and characteristic features of students, to have a large data set, and to determine what changes have occurred in these characteristics of students over the years.

The content of professional development activities for teachers should be reviewed, activities that will increase teachers' classroom management skills should be emphasized, and trainings should be organized to meet the needs and contribute positively to teaching. In addition, teachers with high seniority should be encouraged to participate in professional development activities. According to the results, it was seen that the classes of the teachers from the mathematics department of the faculty of education are more successful. Teachers should be given opportunities to update and improve themselves in the fields of pedagogy and mathematics, as well as the necessary permission and support. In this study, the most important teacher characteristic related to mathematics achievement is the level of professional satisfaction of the teacher. It is recommended to give the necessary importance to the teaching profession and teachers and to carry out the necessary studies for teachers to have better living and working conditions.

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Author (s) Contribution Rate

The authors contributed equally to the study.

Conflicts of Interest

No potential conflict of interest was reported by the authors.

Ethical Approval

Ethical permission (04.11.2016-2572) was obtained from Hacettepe University Ethics Committee institution for this research.

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Examining the Relationship between the Meaning Attributed to Marriage and Loneliness: The Mediating Role of Hopelessness

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Examining the Relationship between the Meaning Attributed to Marriage and Loneliness: The Mediating Role of Hopelessness*

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Abstract

In this study, the mediating role of hopelessness in the relationship between the meaning attributed to marriage and loneliness was examined. The study group consists of 567 participants (348 male, and 219 female). Data were obtained using "Meaning Attributed to Marriage Scale", "UCLA Loneliness Scale Short Form" and "Beck Hopelessness Scale". In line of research hypothesis, the research data were analyzed using regression analysis. In addition, whether hopelessness has a statistically significant mediating effect on the relationship between the meaning attributed to marriage and loneliness was tested using the mediator model in line with the research hypotheses. In the mediator model tested, it was seen that hopelessness had a partial mediating effect on the relationship between the positive and negative meanings attributed to marriage and loneliness.

Keywords: Marriage, Positive meaning attributed to marriage, Negative meaning attributed to marriage, Loneliness, Hopelessness.

Introduction

Although marriage differs from culture to culture, it can be said that it is a type of relationship that is accepted in almost all societies. Marriage, which is legally seen as an agreement between two people and a commitment contract between spouses (Cott, 2002; Rauch, 2004), is also defined as a social institution. Marriage also regulates the general health status of spouses and supports life satisfaction (Hayward & Zhang, 2006). While marriage means the condition of living in society, a means of eliminating loneliness and providing a comfortable financial future; it is also seen as a way to have children. In this context, it can be said that the expectation and meaning of marriage change according to the needs of each individual (Yazıcı, 2020).

People naturally have a need for meaning, and they attribute various meanings to marriage. (Güler, 2021). While some individuals define marriage as a new beginning, a continuation of the generation, sexual union, responsibility, not being alone, being a family, and sharing life, some individuals think that marriage is a result of social pressure and marriage is just a signature (Baş & Cengiz, 2018). The meanings that individuals attribute to marriage are generally shaped by the images they create (Tekin, 2020). These images differ with the quality of the time individuals spend with their spouses, whether the expectations are met in marriage (Özabacı et al., 2019), the individual's attachment style, the marriage of their parents, and their past lives (Yıldırım, 2019). In addition, the concepts of hopelessness and loneliness can be counted among the important factors affecting the image of marriage in terms of negatively affecting individuals' mood, cognitive perceptions, attribution styles, future expectations, and beliefs about the future (Turan, 2010).

Psychological problems experienced by the individual can affect their views on marriage and, as a result, marital satisfaction and quality. Loneliness and hopelessness are seen as factors that affect an individual's views on marriage (Kahraman, 2018; Vatan & Dağ, 2009). Loneliness is an undesirable experience and a subjective process based on individuals' expectations and perceptions of the lack of social relationships (Jones & Hebb, 2003). Ünlü (2015) defines loneliness as an emotion felt by synthesizing the desire to be in close relationships with others in a cognitive, emotional, and behavioral context. In this process, the individual evaluates his past

* This study was produced from the master's thesis conducted by the first author under the supervision of the second author.

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and present relationships with cognitive processes, creates negative emotions due to personal evaluations, and may develop a behavioral pattern of loneliness.

Factors causing loneliness include pessimism, shyness, fear of self-expression (Michela et al., 1982), inability to establish relationships, traumatic experiences, and avoidance of relationships with partners of the opposite sex (Buluş, 1996). Lonely individuals are more likely to make wrong choices because they are insufficient to initiate and maintain a relationship with the opposite sex. Individuals who prefer loneliness believe that they will be constantly hurt and disappointed, and at the same time, these individuals who are worried about emotional attachment think that they cannot satisfy their partners' emotional needs (Young, 1982). In this context, the negative thinking styles of individuals who have a sense of loneliness affect the person's view of romantic relationships and marriage in many ways.

It can be thought that the concept of hopelessness also has an important effect on the meaning attributed to marriage since the individual has negative expectations for the future, and the feelings of pessimism and helplessness affect the individual negatively at the cognitive level. Hope is a universal concept with a strong impact on life (Moore, 2005). In this respect, the concept of hope has vital importance for the individual. In the absence of it, it is stated that it evokes dying while living (Aydın et al., 2015). Hopelessness is when a person has a negative attitude toward the future and loses motivation for it (Üngören & Ehtiyar, 2009). A hopeless individual experiences negative emotions such as loss of will to live, deterioration in perception, difficulty remembering the past, unhappiness, helplessness, pessimism, loss of courage, irritability, and not being able to enjoy life (Öz, 2010). As a result of these negative emotions, the deterioration of the individual's perception of the environment may also affect their relationships, attitudes, and perspectives. In this respect, it can be thought that the meaning attributed to marriage by individuals who experience hopelessness and pessimism will also differ.

When the literature is examined, many studies examine loneliness and hopelessness together (Chang et al., 2015; Demirel et al., 2015; Girgin, 2009; Pervin & Ferdowshi, 2016). However, no study was found in which loneliness, hopelessness, and the meaning attributed to marriage were examined together. According to the results of the research, there is a positive relationship between hopelessness and loneliness, and they predict each other. It is thought that the concepts of hopelessness and loneliness have an important effect in terms of changing the cognitive perceptions and attribution styles of the individual and thus affecting the meaning attributed to marriage. It is thought that examining how hopelessness has a mediating role between the meaning attributed to marriage and loneliness in terms of reducing positive expectations for the future and creating feelings of pessimism and helplessness will contribute to the literature. In this context, in this study, an answer to the question "Does hopelessness mediate the relationship between the meaning attributed to marriage and loneliness?", was sought.

Method

Research Design

The research model is the relational research model, one of the quantitative research methods. The relational research model is a research model that aims to determine whether there is a relationship between two or more variables and the degree of this relationship (Büyüköztürk et al., 2008). In this research model, it has been tried to examine whether hopelessness has a mediating role in the relationship between the meaning attributed to marriage and loneliness.

Participants

The study group for research consists of a total of 567 participants, 348 (61.4%) female and 219 (38.6%) male. Among the participants, there were 220 (38.8%) people who had a romantic relationship and 347 (61.2%) people who did not have a romantic relationship.

Measures

The Scale of Meaning of Marriage (SMM)

Developed by Özabacı, Körük, and Kara (2018), The Scale of Meaning of Marriage (SMM) consists of 31 items. The seventh and eighteenth items on the scale are reverse-scored. The scale is a 5-point Likert scale (1-I

disagree, 5-I agree) type measurement tool. According to the exploratory and confirmatory factor analyses, the findings show that SMM has a nine-factor structure. The sub-factors of SMM are functionality, devotion, intimacy, complementarity, frustration, struggle, cooperation, risk, and compliance expectancy.

The Cronbach-Alpha internal consistency coefficient was found to be .80 for the WHOLE SCALE, and it took values between .41 and .77 for the sub-factor. Two general total points are taken from the scale, namely the positive meaning score and the negative meaning score attributed to marriage, and each factor is scored within itself. The highest positive marriage meaning score that can be obtained from SMM is 105, and the lowest is 23. The highest negative marital meaning score that can be obtained from the scale is 40, while the lowest is 8. When we look at the positive marital meaning scores, an individual's score higher than 69 indicates that he or she generally attributes a positive meaning to marriage, while a negative meaning score of 24 points indicates that the individual attributes a negative meaning to marriage.

The UCLA Loneliness Scale Short Form (ULS-8)

The UCLA Loneliness Scale Short Form (ULS-8) was developed by Hays and DiMatteo (1987) and adapted into Turkish by Doğan et al. (2011). Within the scope of the study, exploratory factor analysis was performed on the UCLA Loneliness Scale (ULS-20), developed by researchers Russell, Peplau, and Cutrona (1980), and as a result of the analysis, a 5-factor structure was obtained, and the UCLA Loneliness Scale Short Form (ULS-8) was formed with 8 items collected in the first factor. The scale consists of a 4-point Likert type (1–Not at all suitable, 4–Completely appropriate), and there are 2 reverse coded items (3rd and 6th items). The highest score that can be obtained from the scale is 32, and the lowest score is 8. As the scores obtained from the scale increase, the loneliness level of the individual also increases.

The Beck Hopelessness Scale

The scale developed by Beck et al. (1974) was adapted into Turkish by Seber (1991). The scale consists of 20 true-false propositions with 11 true and 9 false key answers. 1 point is given for each compatible answer to the key, and 0 points are given for each incompatible answer. The total score obtained was accepted as the "Hopelessness score". The possible variability of scores ranges from 0 to 20. Turkish form of BHS. As a result of the reliability studies conducted by Beck et al., the internal consistency coefficient of the scale was reported as 0.93. According to the factor analysis performed in the construct validity study, it was revealed that the scale consisted of three factors: "feelings about the future",loss of motivation," and "hope (Durak and Palabıyıkoğlu, 1994). In addition, the ability of the scale to discriminate between the patient and control groups was examined, and it was found that the difference between the mean scores obtained from the patient and control groups was significant (Seber, 1991; cited in Savaşır & Şahin, 1997).

Procedure

The data were collected by a convenient sampling method. Convenient sampling is defined as the selection of the sample from easily accessible and applicable units due to limitations in terms of time, money, and labor (Büyüköztürk, 2014). The data collection tools were applied to individuals aged 18 and over residing in different cities in Turkey in the years 2021–2022. The data were collected through a form transferred to the virtual environment. The participants were informed about the purpose, importance, and scope of the research, and the principles of voluntariness and confidentiality were taken as a basis.

Data Analysis

The analysis of the data was made using the SPSS 20.0 package program. The findings were evaluated at the 95% confidence interval and based on the .05 significance level. First of all, the data set was examined to evaluate the suitability of the data for statistical analysis, and it was seen that there was no missing value since the data were collected online. Kurtosis, skewness, and Mahalanobis distance scores were examined for linearity and normality, and 15 values were extracted from the data set. The results of testing the assumptions are presented in Table 1.

The mediation effect of hopelessness in the relationship between the meaning attributed to marriage and loneliness was tested with the mediation analysis based on regression developed by Hayes (2013). Hayes (2013) stated that regression-based mediation analysis is a statistical method used to determine how some causal factor X transfers its effect to Y.

Table 1. Descriptive statistics and test results for the normality assumption

	N	Minimum	Maximum	$\bar{x}$	Sd	Skewness	Kurtosis
Positive Meaning Attributed to Marriage	567	52	115	91.80	15.324	-.541	-.791
Negative Meaning Attributed to Marriage	567	14	31	22.52	4.064	.113	-.744
Loneliness	567	8	27	14.89	4.199	.467	-.295
Hopelessness	567	0	20	8.71	4.346	.121	-.788

According to Table 1, skewness values vary between -.541 and .467, and kurtosis values range between -.791 and -.295. According to the table, it was seen that the skewness and kurtosis values of all variables were between +1 and -1. Skewness and kurtosis values between +1 and -1 are acceptable limits for the assumption of normality (Hair et al., 2013). Accordingly, it was accepted that the data showed a normal distribution.

Results

Findings on the Mediating Role of Hopelessness in the Relationship Between Positive Meaning Attributed to Marriage and Loneliness

The Process Macro application developed by Hayes (2013) was used to determine whether hopelessness mediates the relationship between the positive meaning attributed to marriage and loneliness. The bootstrap technique was applied in the regression analysis using Model 4 in Process Macro. The results obtained are presented in Table 2.

Table 2. Findings on the mediating role of hopelessness in the relationship between positive meaning attributed to marriage and loneliness

Predictors	Hopelessness (M)			Positive Meaning Attributed to Marriage (Y)		
	β	SE	t	β	SE	t
Loneliness (X)	.213	.045	4.704	-.759	.154	-4.918
Hopelessness (M)	-	-	.	-.845	.141	-5.973
Constant	5.555	.691	8.031	110.632	2.435	45.422
	R^2 =.0384, $F(1,554)$ = 22.134, p< .01			R^2 =.1184, $F(2,553)$ = 37.119, p< .01		
Bootstrap Results for Indirect Effects			β	Boot SE	BootLLCI	BootULCI
Indirect Effect	Hopelessness		-.047	.013	-.075	-.024

The results of the regression analysis showing the effect of hopelessness (M), which is the mediator variable between loneliness (X) and the positive meaning attributed to marriage (Y), are given in the table. Accordingly, loneliness was found to predict hopelessness positively (β = .213; t = 4.704; p < .05). At the same time, it was determined that loneliness predicted the positive meaning attributed to marriage negatively (β = -.759; t = -4.918; p < .05). On the other hand, it was found that hopelessness negatively predicted the positive meaning attributed to marriage (β = -.845; t = -5.973; p < .05). In this context, when the indirect effect of the mediator variable in the 95% confidence interval is examined, BootLLCI = -.075 for hopelessness is calculated as BootULCI = -.024. Since both bootstrap lower (BootLLCI) and upper (BootULCI) values in the 95% confidence interval are below zero, hopelessness has a significant mediating role in this model. Looking at the fully standardized effect size of the mediation effect (K2hopelessness = -.047), it is seen that hopelessness has a mediating effect close to the middle value. In Figure 1, the graphical representation of Model 4 is given.

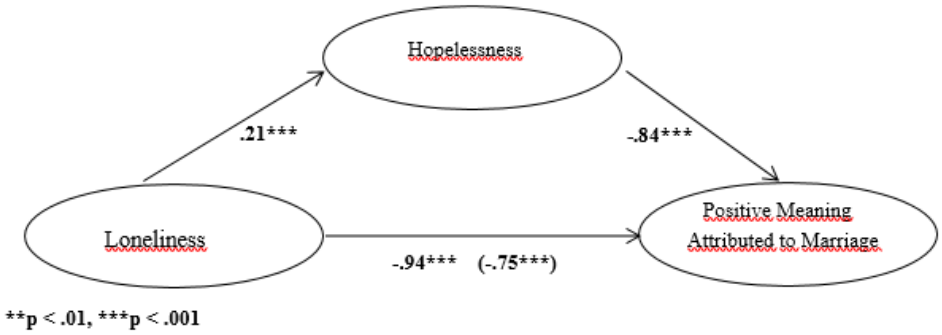

Figure 1: The mediating role of hopelessness in the relationship between the positive meaning attributed to marriage and loneliness (Model 4)

Findings on the Mediating Role of Hopelessness in the Relationship Between Negative Meaning Attributed to Marriage and Loneliness

To determine the mediator role of hopelessness in the relationship between the negative meaning attributed to marriage and loneliness, the bootstrap technique was used in the regression analysis, and the findings are shown in Table 3.

Table 3. Findings on the mediating role of hopelessness in the relationship between negative meaning attributed to marriage and loneliness

Predictors	Hopelessness (M)			Negative Meaning Attributed to Marriage (Y)		
	β	SE	t	β	SE	t
Loneliness (X)	.213	.045	4.704	.131	.038	3.395
Hopelessness (M)	-	-	.	.421	.035	11.9045
Constant	5.555	.691	8.031	16.920	.6084	27.8109
	R^2 =.0384, $F(1,554)$ = 22.134, p< .01			R^2 =.2413, $F(2,553)$ = 87.924, p< .01		

Bootstrap Results for Indirect Effects		β	Boot SE	BootLLCI	BootULCI
Indirect Effect	Hopelessness		.0200	.0502	.1278

When Table 3 is examined, loneliness positively predicts hopelessness (β = .213; t = 4.704; p < .05). However, it was determined that loneliness positively predicted the negative meaning attributed to marriage (β = .131; t = -3.395; p < .05). However, it was determined that hopelessness positively predicted the negative meaning attributed to marriage (β = .421; t = 11.9045; p < .05). In this context, when the indirect effect of the mediator variable in the 95% confidence interval is examined, BootLLCI = .0502 for hopelessness is calculated as BootULCI = .1278. Since both bootstrap lower (BootLLCI) and upper (BootULCI) values in the 95% confidence interval are above zero, hopelessness has a significant mediating role in this model. When the fully standardized effect size of the mediation effect is examined (K2hopelessness = .08), it is seen that hopelessness has a mediating effect close to the middle value. In Figure 2, the graphical representation of Model 4 is given.

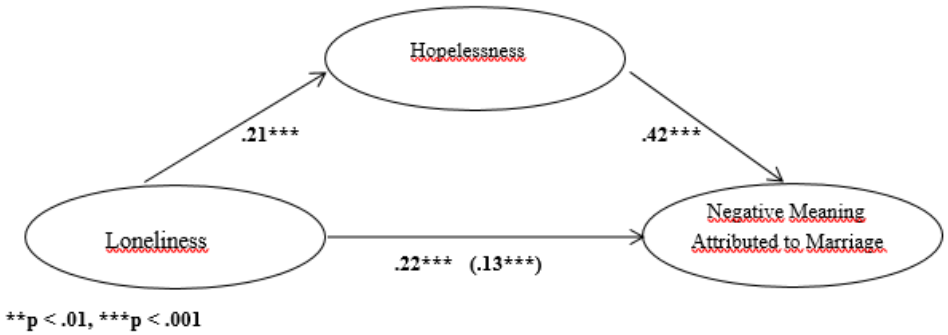

Figure 2: The mediating role of hopelessness in the relationship between the negative meaning attributed to marriage and loneliness (Model 4)

Discussion and Recommendations

In the current study, it was examined whether the variable of hopelessness had a mediating role in the relationship between the meaning attributed to marriage and loneliness, and it was determined that hopelessness partially mediated the relationship between loneliness and the positive and negative meaning attributed to marriage. When the relevant literature was examined, no other research findings were found in which this model was tested. The mediator variable is defined as the variable that increases the effect of the independent variable on the dependent variable (Baron & Kenny, 1986). According to the results obtained, when the hopelessness variable is kept constant, the relationship between the positive meaning attributed to marriage and the negative meaning of loneliness decreases. To be more clearly expressed, despair: Finding a mediator role in the relationship between loneliness and the meaning attributed to marriage can be interpreted as the increase in the level of hopelessness increasing or strengthening the predictor of the individual's loneliness level on the meaning attributed to marriage. Considering that the hopelessness levels of individuals have significant relationships with both loneliness and the positive and negative meaning attributed to marriage, it can be seen as an expected result that hopelessness is a mediator variable in the meaningful confidence interval. According to this result, the high level of loneliness among individuals affects the positive meaning attributed to marriage negatively, but it explains that with the increase in hopelessness levels, the positive meaning attributed to marriage will be at a lower level. Similarly, the increase in the loneliness levels of individuals increases the negative meaning attributed to marriage, but it is seen that the negative meaning attributed to marriage will be higher with a high level of hopelessness.

Inadequate life satisfaction and future expectations, low self-esteem, vulnerability schema, depression, and suicidality lead people to despair. Hopelessness causes the individual to develop a negative cognitive attribution style (Abramson et al., 2002). In this context, individuals' cognitively negative perspective also lays the groundwork for their pessimistic approach to the future. Based on this situation, hopelessness is a mediating variable for the meaning attributed to marriage in individuals with high levels of loneliness; It may be related to aspects that create future anxiety, prevent the formation of positive expectations about the future, and have negative feelings that nothing will go well no matter what the individual does (Ottekin, 2009). Since these negative feelings and thoughts are very strong predictors of both hopelessness and loneliness, it may be expected that the two variables together increase the negative meaning of marriage and decrease the positive meaning. Depression, which is the most important predictor of loneliness and hopelessness, has been defined as a disease that causes symptoms such as worthlessness, reluctance, weakness, and pessimism in the individual (Öztürk & Uluşahin, 2015). In the literature, there are many studies on depression, hopelessness, and loneliness. According to the results of the research, depression creates negative thoughts in the cognitive schemas of the person, and as depression progresses, negative thoughts become increasingly dominant (Arkar, 1992). The increase in feelings of worthlessness, reluctance, and powerlessness in depressed individuals may cause them to feel even more lonely. As a result, it can be said that the increase in pessimism and negative thoughts in the individual, the decrease in beliefs about the future, and the increase in hopelessness levels will increase the negative meaning attributed to marriage and decrease the positive meaning.

Shortcomings and Limitations

However, the results should be interpreted in terms of the shortcomings and limitations of the study. First, the current study was conducted with a convenience sample of non-infected individuals. The results of the present research are simply based on the self-reports of the participants. This study has limitations due to the correlational research method. Experimental studies can be conducted on these subjects in future studies. Since the meaning attributed to marriage, which is one of the research variables, is a new concept in the literature, studies on it are limited. Therefore, it can be repeated more often in different variants and in various examples. Example of unmarried couples or divorced persons living together; It can be developed by examining different socio-demographic variables such as traumatic experience, education level, place of residence, and income level. In order to reduce the loneliness levels of individuals and strengthen their social support resources, structured psycho-educational group studies can be conducted starting in preschool, including topics that develop social skills such as communication skills, social skills, and assertiveness. Based on the conclusion that successful marriages create happy families and happy families create healthy societies, marriage education can be taught as a course in formal education institutions, or programs related to marriage education can be organized through mass media. When the literature is examined, no research has been found that includes all three of the variables examined within the scope of the research. More studies are needed due to the limited number of studies examining the positive and negative meanings attributed to marriage, loneliness, and hopelessness. In this respect, it is thought that this research will be informative for future studies.

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Author (s) Contribution Rate

The authors of the study contributed equally at all stages, from the planning of the research to the writing of the discussion part.

Conflicts of Interest

There is no conflict of interest in the present research.

Ethical Approval (only for necessary papers)

Ethical permission (07.09.2021-76212) was obtained from Duzce University Scientific Research Institute for this research.

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A Product of the Instructional Design Process Developed According to the Seels and Glasgow Model: Interactive Hologram-Supported Material Set

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A Product of the Instructional Design Process Developed According to the Seels and Glasgow Model: Interactive Hologram-Supported Material Set

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Abstract

This study aims to design an educational process for teaching scientific concepts during the preschool period based on the instructional design model of Seels and Glasgow and to evaluate its effectiveness. For this purpose, a material set incorporating a teacher's manual and interactive holographic materials was developed. The teacher's manual developed has an inquiry-based approach according to which scientific concepts are structured in line with scientific information. Expert opinions were obtained regarding the developed material set. It was determined that the material set developed in line with expert opinions may be supportive in teaching scientific concepts in the preschool period. Moreover, it was found that the developed material set helped the concretization of abstract concepts that are difficult to observe and that require a process and assisted the children in constructing scientific information in their minds by way of generating realistic three-dimensional images. It is anticipated that, with the interactive holographic material set developed during the research, the lack of materials and scientific information in the preschool teaching process of scientific concepts may be prevented.

Keywords: Holographic technology, Seels and Glasgow model, Preschool, Scientific process skills

Introduction

Innate senses of curiosity and discovery lead the preschool children to make sense of their environment. In this process of making sense, children act as scientists to reach information (Casteel, 2017). Beginning the science education in this period, during which a child is full of curiosity, favourably affects the sense of curiosity as well as motivation for science (Eshach and Fried, 2005). Science education given during this period has an important role in rendering children aware of the concepts and events of the world (Campbell and Jobling, 2012). In addition, science education provides the opportunity for the children to inquire about the world, solve problems, and develop their problem-solving skills and thinking abilities (Samarapungavan, Patrick and Mantzicopoulos, 2008). Therefore, the education given during the preschool period is critical for a child's development.

The basis of science education is to make sense of real-life events and circumstances; hence, science education is an inquiry-based discipline (Rönnebeck, Bernholt and Ropohl, 2016; Mariegaard, Seidelin and Bruun, 2022). In an inquiry-based approach, children ask questions and seek answers to the situations they wonder about. They even try to explain the reality and causes of the situations they come across in their surroundings and make inferences regarding these situations. Moreover, it is known that the activities of inquiry-based learning contribute to the development of scientific process skills in students (Stout, 2001; Sullivan, 2008; Şimşek and Kabapınar, 2010; Wu and Hsieh, 2006; Wu and Krajcik, 2006). Structuring concepts in line with scientific information through inquiry-based science education may develop children's skills of observation, comparison, categorization, communication, measurement, anticipation, and inference (Jackman, 2011). In this way, children may make sense of the causes-results of concepts or events more easily (Trundle, Atwood, Christopher and., Saçkes, 2010). During the preschool period, children go through a fast-paced concept generation process. In order to prevent any mislearning and misconceptions (alternative concept), technology must be used effectively (Yilmaz and Sığirtmaç, 2020).

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Concepts are learned through the activities or experiences of the child (Fleer, 2009; Tu and Hsiao, 2008). In this respect, it is important to make room for real-world-based materials in educational environments to allow children to make sense of items such as scientific phenomena and concepts correctly in their minds. Enriched educational environments generated with the support of various technological materials may help children concretize concepts and thus contribute to permanent learning (Altun, 2018). However, it is a known fact that children's concentration processes differ from those of adults and that the former get bored easily (Cameron, 2005). On the other hand, children's capabilities of differentiating between imagination and reality, as well as between the living and the lifeless have also not been developed yet in the preschool period. For the sake of generating appropriate learning environments, such characteristics of children must be taken into account; it is possible to integrate technological materials that fit the children's level of development into the preschool curriculum.

It was determined that the use of technology in the preschool period furnished children with the skills preparing them for primary school and enhances their permanent learning (Brooker and Siraj-Blatchford, 2002; Roopa, Prabha and Senthil, 2021). develops their memory skills (Haugland, 1999), gives them the opportunity to learn through practise and experience (Kara and Çağıltay, 2017), and increases their motivation (An, Morgenlander and Seplocha, 2014; Yılmaz, 2016). It is known that, for the children of the preschool period, during which abstract concepts are hard to grasp, the use of technology, considering their developmental characteristics, helps children visualise difficult or abstract concepts (Futschek and Moschitz, 2010; Klein, Nir-Gal and Darom, 2000). Moreover, it was observed that technology develops children's skills in areas such as creativity, critical thinking, and problem-solving (Blackwell, Lauricella, and Wartella, 2014; Siraj and Siraj, 2001), lends them the opportunity to work in cooperation and enhances their communication skills (Shifflet, Toledo, and Mattoon, 2012), allows them to be active in the learning process and favourably affects the learning process (Karadeniz, Samur and Özden, 2014), and develops their listening skills (Yilmaz, Küçük and Göktaş, 2017). It is stated that technology supports children's learning and helps them share their experiences. In addition, technology is important for the improvement of children's social, emotional, physical, and cognitive development (Clements and Sarama, 2003; Plowman and McPake, 2013; Plowman and Stephen, 2003; Yelland, 2011) as well as enriching their educational processes (Blackwell et al., 2014; NAEYC, 2012). Hence, considering the potential benefits of using technology correctly, it is indispensable to integrate technology into the preschool curriculum (NAEYC, 2012; Plowman and Stephen, 2007; Spektor-Levy, Plutov, Israeli and Perry, 2017).

With hologram technology, one of the three-dimensional technologies (like augmented reality, virtual reality, etc.), realistic images started to be used as an alternative to customary two-dimensional images (Mnaathr and Basha, 2013). When compared to two-dimensional technologies, three-dimensional technologies provide students the opportunity to learn through practise and experience by allowing them to examine the designed objects from different angles (Wu, Lee, Chang, and Liang, 2013). In this regard, when using three-dimensional technologies, students actively take part in the process, which enables permanent learning (Chen, Chi, Hung, and Kang, 2011; Dunleavy, Dede, Mitchell, 2009; Wojciechowski and Cellary, 2013). Moreover, these technologies attract children's attention and render the learning process more exciting for them (Oh and Woo, 2008; Wojciechowski and Cellary, 2013; Zhou, Cheok, and Pan, 2004). Accordingly, three-dimensional hologram technology would contribute to concretizing abstract concepts, easy comprehension of subjects that are difficult to grasp, the presentation in a realistic manner of objects and events that cannot be observed or that require a process of observation, and children's meaningful learning (Barkhaya and Halim, 2017; Eschenbrenner, Nah, and Siau, 2008; Ghuloum, 2010). Thus, it becomes possible for the children to understand concepts correctly and to generate schemas accordingly in their minds by giving them the sense that the objects that are indeed not present at that specific location, are there (Odabaşı, 2015). Moreover, it is mentioned that the use of three-dimensional hologram technology for educational purposes enhances the quality of educational processes (Ghuloum, 2010). Several reasons have been put forward in favour of using this technology in the area of education. To name a few: its ability to contribute to the development of children's cognitive skills by increasing attention, participation, and interaction (Barkhaya and Halim, 2017), to provide the learners with convincing images (Kalansooriya, Marasinghe and Bandara, 2015), to develop spatial thinking skills and depth perception (Okulu and Ünver, 2016). In this respect, using this technology in the instruction of scientific concepts that are difficult to grasp and that require a process would favourably affect learning. Moreover, as it is known that the education given during the preschool period is critical in terms of children's development, providing education in this period on a sound basis (Hadzigeorgiou, 2001), is significant for the generation of the right schemas in children's minds and for the prevention of conceptual confusion.

When the relevant literature about the use of three-dimensional hologram technology in education was examined, it was observed that this technology is used more frequently in medical science and engineering (Golden, 2017; Hackett, 2013; Hackett, 2018; Freeman, 2010; Kalansooriya et al., 2015; Musion, 2014; Khan et

al., 2013, Romero et al., 2015; Sudeep, 2013; Vanden Bosch et al., 2005), while no studies were encountered in the area of preschool science education. However, in their study with science teacher candidates, Okulu and Ünver (2016) mentioned that the education given with this technology would favourably affect spatial thinking ability and depth perception. Mnaathr and Basha (2013) state that hologram technologies may be used for easing comprehension of scientific topics and teaching concepts in science education. Olson (2013), on the other hand, especially proposes the use of 3D hologram technology in the area of science. As regards preschool education, Monnin (2010) emphasises that 3D technology excites children and attracts their attention, and Barkhaya and Halim (2017) stress that this technology constitutes interactive material that attracts the attention of children in the learning process and contributes to the development of their cognitive skills in the best way. In this context, this research aimed to design a learning process for teaching scientific concepts during the preschool period and to assess its impact. It was decided that, with regard to the interactive holographic material set (teacher's manual and interactive holographic material), the Seels and Glasgow instructional design model is appropriate for the cyclical improvement of the design, development, implementation, assessment, and commissioning processes of the material. This model was selected because it is a product-oriented model that is based on systemic work on instructional problems and learning conditions. The Seels and Glasgow model is designed for product and course developers, with the expectation that the results will be disseminated for others to use. This model, which considers design and development in the context of project management, focuses on the fact that the steps in the instructional design phase are interdependent and simultaneous and should be handled in an iterative cycle (Gustafson and Branch, 2002).

Designing the Learning Process

In this study, Design and Development Research was used as the research model. Design and Development Research systematically addresses the design, development, and evaluation of instructional models, curricula, instructional tools, instructional processes, and instructional products (Richey and Klein, 2007). Design and Development Research is an important research method in the field of instructional technologies as it helps researchers in the process of developing instructional products (Çağıltay and Göktaş, 2013). In this study, which is a Design and Development Research, Seels and Glasgow instructional design model was used as the basis for the design and implementation of the learning process. Seels and Glasgow instructional design model consists of different phases and sub-titles under these phases. Seels and Glasgow instructional design model was defined as the systematic analysis of learning conditions and learning problems. The model was established on a linear structure and has ADDIE's project management process covering analysis, design, development, implementation, and assessment phases (Seels and Glasgow, 1998). The model has problem analysis in the problem phase; task analysis and instructional analysis; determination of objectives and benchmarks; instructional strategies and delivery systems in the design phase; material development and formative evaluation in the development phase; implementation , maintenance, and summative evaluation in the implementation-evaluation phase. Four phases of this model are presented in Figure 1 by separating them from each other by different colours.

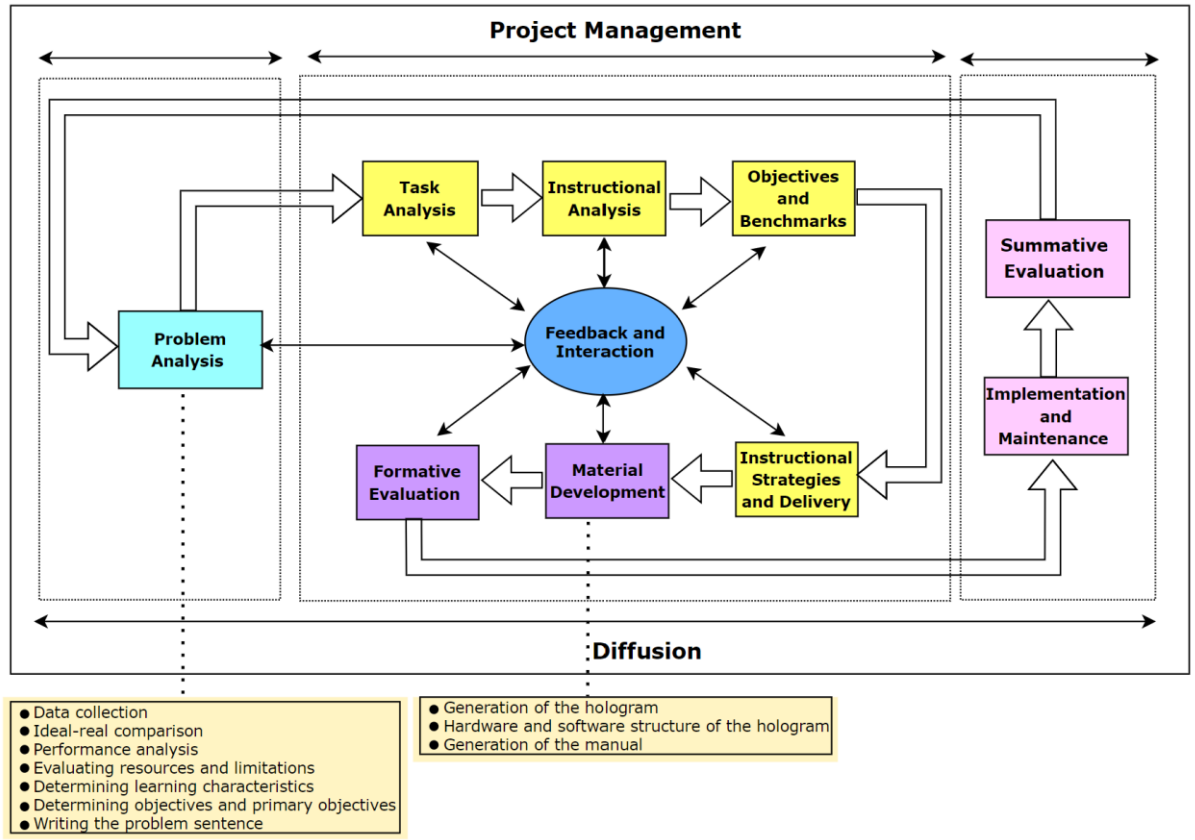


Figure 1. An adaptation of the Seels and Glasgow instructional design model to this study

Seels and Glasgow is a compound model structured on the basis of a core and an interactive model (Şimşek, 2009). It addresses instructional design as a process of the core model while focusing on the correction of the disrupted aspects of this process with its interactive model (Figure 1). In the Seels and Glasgow model, in order to present more stable designs to learners and to make more efficient production, the process is continuously reviewed before its competition (Keleş, Erümit, Özkale and Aksoy, 2016). Information is presented below about how the instructional design process is carried out for 3D interactive holographic material set according to the Seels and Glasgow model. Each lower step of the model is provided by detailing what kind of systematic transactions about instructional design are performed in that particular step.

Problem Analysis Phase of the Seels and Glasgow Model

The first phase of the Seels and Glasgow model, namely the problem analysis phase, incorporates "collection of data, ideal-real comparison, performance analysis, evaluation of resources and limitations, determination of learning characteristics, determination of objectives and primary objectives, and writing a problem sentence" (Seels and Glasgow, 1998, p. 196).

a) In the data collection process, several tools are made use of, such as surveys, observation and interviews, in order to gather information about the content of the research envisaged to be done and regarding the student, teacher, and learning environment. The teacher plans, implements, and evaluates the learning process; in other words, the teacher is the one who shapes the learning process and thus has a direct impact on the learning processes of children. Accordingly, within the scope of the research, 32 preschool teachers who serve across the country were determined on a voluntary basis, and through an electronic survey composed of open-ended questions, their opinions were obtained on which scientific concepts are difficult to be taught, why such difficulty is faced, and the usability of hologram technology in the instruction of the concepts that are difficult to grasp.

b) In the ideal-real comparison process, a potentially accessible situation is determined by considering the desired and current conditions. When the scientific concepts, about which teachers consider themselves to have insufficient knowledge, were analysed, as they were high in numbers and consisted of different areas, the determined concepts were narrowed down. Therefore, among the concepts of the preschool curriculum, the

concepts in the area of "Earth and Space Sciences" were focused. These concepts were determined to be 'Rain', 'Snow', 'Hail', 'Fog', 'Cloud', 'Lightning', 'Rainbow', 'Night', 'Day', 'Earth', 'Sun', 'Moon'; 'Spring', 'Summer', 'Fall' and 'Winter'. Moreover, it was determined in line with the opinions obtained from Computer Education and Instructional Technology (CEIT), science, and preschool education experts that the interactive holographic material set must be applied to children at the age of 60 months and older. Age groups were narrowed down with the consideration that other age groups in the preschool period may lose their sense of reality in this process.

c) In the process of performance analysis, conditions such as the knowledge and skills of the teacher as well as the student's success and motivation are analysed. Except for the 32 preschool teachers serving throughout the country, some preschool teachers were selected randomly, and primary interviews and observations were made one-on-one. As a result, it was observed that teachers lacked sufficient knowledge about scientific concepts. Furthermore, it was determined that in teaching the relevant concepts, they either do not make room for a great deal of scientific information or evade explaining these concepts.

Enough silence is ensured in the classroom, and students' seating arrangements have been appropriately made under the influence of the teacher. These situations favourably affect student performance. It is considered that children's interest may be increased by providing concrete examples. This interest would also favourably affect the performance in the class. Moreover, as a result of the interviews with the preschool teachers, the operational course of the lesson was planned by observing the differences in learning styles and speeds of children.

d) In the process of evaluating resources and limitations, current resources and training materials are examined, and limitations are determined. In this respect, it was determined in the research that teachers treat the concepts by using videos, drama techniques, and verbal explanation and that they experience a lack of materials in the teaching process. In addition, it was found that teachers lack scientific knowledge in relation to scientific concepts. It was considered that this situation may be solved by making use of concrete materials convenient to children's developmental characteristics and prepared in the light of scientific knowledge.

e) In the process of determining learning characteristics, the fact that the content is composed of which of the cognitive, affective, and kinesthetic behaviours, is focused is important. As the focus here is the teaching of preschool scientific terms by using holographic material, children's cognitive behaviours were taken as a basis.

f) In the process of determining objectives and primary objectives, the main and primary objectives of the research are determined. Accordingly, in order to reach the objectives determined within the framework of the research, our focus has been on the development of a material set that allows for teaching the concepts regarding the "Earth and Space Sciences" via an interactive holographic material set and the evaluation of the effects of this material set on the learning process.

g) In the process of writing the problem sentence, the situation that emerged in the problem analysis step is analyzed, and the problem sentence is generated. Accordingly, the problem sentence of this research is the design of an instructional process for teaching scientific concepts in the preschool period and the evaluation of its effect.

The Design Phase of the Seels and Glasgow Model

The design phase of the Seels and Glasgow model covers the processes of "task analysis, instructional analysis, determination of objectives and benchmarks, teaching strategies, and delivery system". Each of the aforementioned phases and what was done in each phase are presented below.

In the process of task analysis, the answer to the question of "What is the work to be done?" is sought. In this process, the general tasks required to perform a specific work are listed (Seels and Glasgow, 1998). Accordingly, the works to be done for teaching scientific concepts by using interactive holographic material in the instructional process were listed by taking the preschool curriculum as a reference, and the purposes related to the subject were written down and the content was selected and organised. Prior to this process, documents on teaching scientific concepts with hologram technology were reviewed, including tasks and learning outcomes. In addition, experts and preschool teachers were interviewed, and observations of the learning environment were made as part of the preliminary study. The purposes and content contained within the scope of Earth and Space Sciences were structured. The purposes of this scope are provided below:

1. To be able to comprehend the basic concepts

2. To be able to understand the emergence phase of the incident, situation, etc.
3. To be able to comprehend the movements of planets and the results of these movements
4. To be able to realize the situations that might occur in the absence of planets
5. To be able to establish connections among the concepts that pertain to the same area of learning.

In the process of instructional analysis; in this step where the answer to the question of "What to teach" is sought, after determining the introductory behaviours of the student towards the lesson, the purposes of the lesson and the behaviours that the student is intended to gain in line with these purposes, are specified (Mendonca, 2003). The behaviours that are expected to be gained by the children at the end of the process in relation to the concepts determined in this step, were formed in line with the preschool programme and preschool experts' opinions. For instance, for the purpose of comprehension of the basic concepts contained within the framework of "Earth and Space Sciences", the children were expected to describe the characteristics of events and situations such as their names, colours, shapes, sizes, sounds, and purposes of use. In this context, a sample objective and the target behaviours that children are expected to acquire at the end of the process in line with this objective are as follows;
Objective 2: To be able to understand the formation phase of events, situations, etc., within the framework of Earth and Space Sciences.
Behaviors
• Explaining the phases of the formation of events and situations in detail
• Defining the differences in the formation phase of events and situations
• Finding possible causes for a situation where the outcome is obvious

In the process of determining objectives and benchmarks; the student who will gain the behavior, the behavior to be gained, characteristics of the environment and behavior criteria, are determined in this step. In this direction, the process was prepared according to the ABCD (Audience, Behavior, Condition and Degree) format and generated with objectives (Seels ve Glasgow, 1998).

In order to support children's academic skills, a rich classroom environment supported by visual materials appropriate for the developmental period should be created, and children should be encouraged to interact with these materials (Uyanık and Kandır, 2010). An interactive material set for the teaching environment was designed in this context. Similarly, the materials were designed with the following criteria in mind:
- Appropriate to the learning environment, curriculum, and developmental characteristics of children,
- Concretization of abstract concepts that are difficult and take time to observe in science teaching,
- Compatibility with current technologies,
- Can be reused multiple times,
- Cost-effective and ergonomic,
- Allowing children to take an active role in the process by having the opportunity to interact.

After the criteria were determined, it was decided to create an interactive environment with the Arduino set for designing the learning material. The environment was made interactive with sensors that appeal to different sensory organs.

In the process of instructional strategies and delivery, the content of the subject matter is involved, while strategies to be implemented and approaches to be taken are determined. In this step, it was decided, by taking children's developmental characteristics into account, to adopt an inquiry-based approach in line with the specified concepts (rain, snow, hail, etc.), Subsequently, in accordance with the inquiry-based approach, interactive scenarios were prepared in which the learner could be active in the process. In addition, during the activities, oral questions were asked to ascertain the knowledge of the learners.

Development Phase of the Seels and Glasgow Model

The development phase of the Seels and Glasgow model covers the processes of "material development and formative evaluation". Accordingly, the phases in the process and what was done within the scope of the research in these phases, are provided below.

In the process of material development; educational software is required to be developed by taking the principles of material preparation into account (Seels and Glasgow, 1998). In this step, the interactive

holographic material set was designed. This material set is composed of interactive holographic material and a manual including scientific information.

The material should not only be prepared in accordance with educational material preparation principles but also fit the educational programme, have up-to-date and correct information, be clear and understandable, objective, and of educational quality. Moreover, the material must be motivational for the student and favourably affect student participation in the lesson. In order not to be exposed to any disruption during application, attention was paid to the material's sufficient technical quality and manual documents were prepared for their use. In this regard, the generation processes for holographic material and the manual are presented below in detail.

Generation of the hologram

The first version of the material was developed in the form of a single-beam reflection hologram (180 degrees) ; however, following the preliminary study performed with the preschool students, it was determined that the single-beam hologram gives the learner the sense of television (Figure 2). Therefore, it was observed that the use of a three- or four-beam reflection hologram is appropriate in the research process. However, it was found in the experiments that larger images are generated in three-beam reflection (360 degrees) than in four-beam reflection (270 degrees).

Figure 2. Hologram sample used in the first version of material

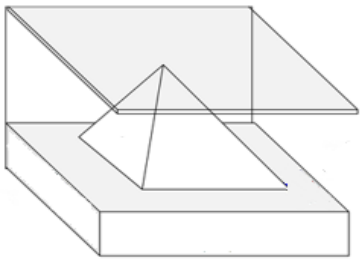
When the studies in the literature on three-beam reflection holograms were examined, it was observed that a pyramidal structure is used in this reflection technique. Moreover, it is mentioned that better images are obtained by using darker backgrounds (Kalarat, 2017). It was also observed that this reflection technique is used with small (5 inches) or large LCD monitors (Handani, Saputra, and Sari, 2017). In the study made with reference to the literature, it was determined to use a 20-inch LCD monitor in order to achieve a better image in the application environment.

In the reflection process based on the three-beam reflection hologram, first a prototype made of cardboard was formed, and then the image was tried to be reflected by using different glass sizes. As a result of the trials, a clear image of the size that may be easily observed by children was achieved in a three-beam reflection hologram performed by using a 2mm-glass. After determining at the end of the process that the reflection should be made with a three-beam technique and a 2mm-glass, the material was formed of wood, and the microcontroller and its connections were placed in it. Moreover, in order to obtain a clear image in the material, the black background was used in the places where the image would be reflected. By improving the quality of images in this way, the hologram image was presented to children in three different dimensions; the left, front, and right reflections. The prototype of the material and its latest version are presented in Figure 3.

Figure 3. Prototype and latest version of the prepared material

Hardware and software structure of the hologram

In the teaching process, the learning approaches that enable children to get away from passive activities and be active in the process and that allow them to reach correct information by making inquiries must be adopted (Brenneman and Louro, 2008; Samarapungavan et al., 2008). Hence, the holographic material set prepared was designed in a way to allow for interaction with sensors and provided the opportunity for the children to take an active role in the process. In this environment generated in the above-mentioned way, the interaction was performed by using different sensors (for instance, an ultrasonic distance sensor, a potentiometer, etc.) addressed to different sense organs. The images in Unity 3D interacted with the digital data (location, angle, etc.) coming from the microcontroller, and the abstract scientific concepts that require a process to observe were tried to be presented with the sense of real-life experience via three-dimensional hologram technology. In the interactive holographic material prepared, sensor communication was performed with an Arduino Mega via a USB connection. The most important reason for preferring this platform is that it is open-source code and can provide enriched media to learners by way of different sensors. Moreover, Arduino is an affordable and easily accessible control card. Figure 4 provides the hardware and software structure of the interactive holographic material prepared in this way.



Hardware
Laptop, PC, etc.
20-inch screen
Speaker
Arduino Mega
Mega Sensor Shield
Sensors

Software
Unity 3D
Arduino Software (IDE)

Figure 4. Hardware and software structure of the interactive holographic material

The sensors in the sensor boxes prepared in a way to address the children (sun figure, lake figure, etc.) were run by plugging them into the analogue and digital entries on the material according to their characteristics. The sensors in the sensor boxes were transformed into different shapes in order to make them more interesting for children. Figure 5 provides some of the sensor boxes containing the sensors used during the activities.

Figure 5. Some sensor box samples containing the sensors used during the activities

In the interactive holographic material, analog and digital entries were differentiated from each other by using sockets in red and blue colors, respectively. A digital and an analogue entry were placed in each of the three sections of the interactive holographic material —the front, right, and left sections, according to the perception of the sensors' data entry variables. In total, three sensors were used in each activity, being one sensor for each section of the material. These sensors vary according to the content of the activities. In the process, children were directing the content prepared according to scientific foundations by engaging in interaction with the help of sensors. 8 sensors in total were used during the activity process (button, joystick, ldr, potentiometer, heat and humidity sensor, switch button, ultrasonic distance sensor, rain sensor), and a sample image pertaining to the sensors and material used in the rain scenario is provided in Figure 6.

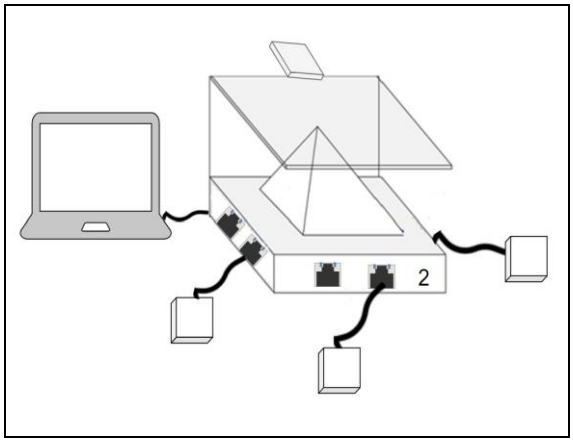


Figure 6 (a). The structure of the prepared interactive holographic material and sensors

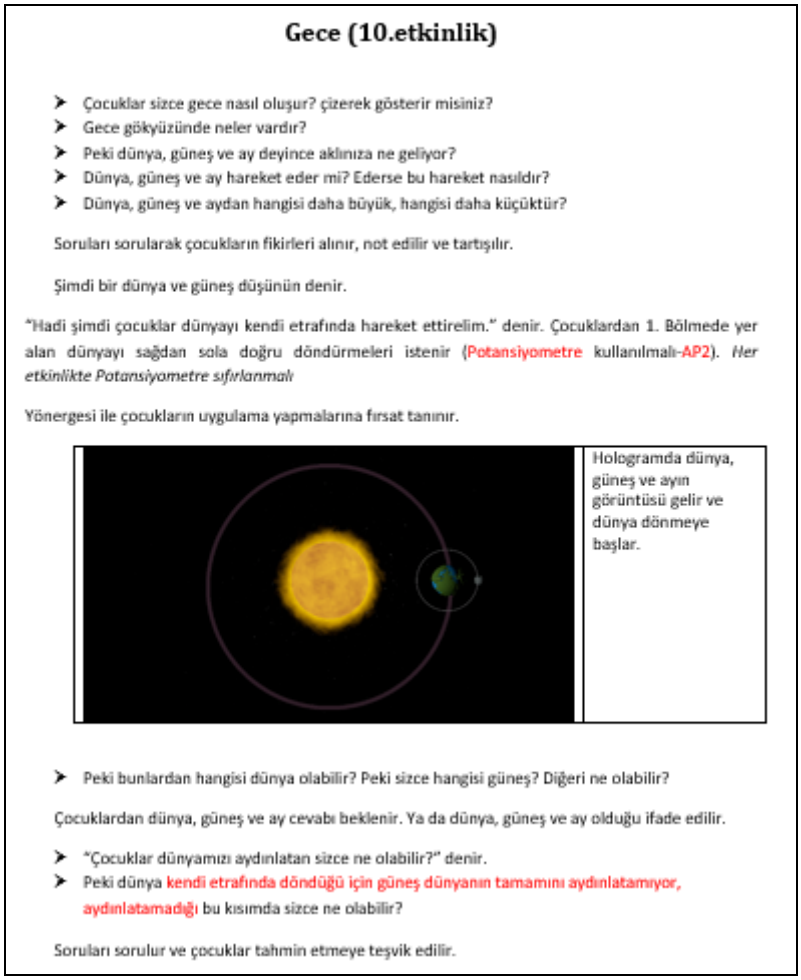
Figure 6 (b). The real image of the prepared interactive holographic material and sensors

Potentiometer, one of the sensors used in the rain scenario, was transformed into a form that will attract children's interest with a blue box. The sun symbol on the box will be used to show sunrise. Accordingly, in line with the directive contained in the manual, the teacher asks the children to turn the sun in the 1st Section, i.e., the potentiometer, from the right to the left. With this interaction of children, the sunrise is shown in the hologram.

Generation of the manual

The teacher's manual, which was prepared for each preschool scientific concept determined within the scope of the research, was developed in line with scientific knowledge. The manual preparation proceeds in parallel with the operation of the material. By integrating questions pertaining to inquiry-based learning activities into the scientific knowledge contained in the manual, an environment was established where children tried to find the answers to these questions during the process. The activities conducted under the supervision of the teacher allow the children to ask questions, discuss, and reflect. Teachers were required to go through the manual to be prepared before the application.

Totalling 21 scenarios, 16 of which pertain to activities and 5 of which pertain to general activities, were present in the manual, which was given to teachers in order to guide them through the treatment of concepts. These activities included 'Rain', 'Snow', 'Hail', 'Fog', 'Rain, snow, hail and fog', 'Cloud', 'Lightning', 'Rainbow', 'Cloud, lightning and rainbow', 'Night', 'Day', and 'Night and day', 'Earth', 'Sun', 'Moon' and 'Earth, sun and moon', 'Spring', 'Summer', 'Fall', 'Winter', and 'Spring, summer, fall and winter'. This manual was designed to help teachers be aware of current misconceptions, if any, and proceed with the activities by addressing their lack of knowledge regarding scientific concepts. The scenarios in the manual were developed in phases in accordance with inquiry-based teaching and in line with scientific knowledge, with reference to the preschool curriculum published in 2013 and approved by the Ministry of National Education (MEB). Opinions were received from science experts regarding the accuracy of the manual and from preschool education experts on whether the information contained in the manual was prepared in accordance with the preschool level. Figure 7 presents a cross-section of the night scenario, which is among the scenarios contained in the manual. In light of the mentioned scenarios, scenes for the interactive hologram-supported material set were created with the Unity software, and the interactions in the scenes were made possible through sensors.



Gece (10.etkinlik)

- Çocuklar sizce gece nasıl oluşur? çizerek gösterir misiniz?
- Gece gökyüzünde neler vardır?
- Peki dünya, güneş ve ay deyince aklınıza ne geliyor?
- Dünya, güneş ve ay hareket eder mi? Ederse bu hareket nasıldır?
- Dünya, güneş ve aydan hangisi daha büyük, hangisi daha küçüktür?

Soruları sorularak çocukların fikirleri alınır, not edilir ve tartışılır.

Şimdi bir dünya ve güneş düşünün denir.

"Hadi şimdi çocuklar dünyayı kendi etrafında hareket ettirelim." denir. Çocuklardan 1. Bölmede yer alan dünyayı sağdan sola doğru döndürmeleri istenir (Potansiyometre kullanılmalı-AP2). *Her etkinlikte Potansiyometre sıfırlanmalı*

Yönergesi ile çocukların uygulama yapmalarına fırsat tanınır.

Hologramda dünya, güneş ve ayın görüntüsü gelir ve dünya dönmeye başlar.

- Peki bunlardan hangisi dünya olabilir? Peki sizce hangisi güneş? Diğeri ne olabilir?

Çocuklardan dünya, güneş ve ay cevabı beklenir. Ya da dünya, güneş ve ay olduğu ifade edilir.

- "Çocuklar dünyamızı aydınlatan sizce ne olabilir?" denir.
- Peki dünya kendi etrafında döndüğü için güneş dünyanın tamamını aydınlatamıyor, aydınlatamadığı bu kısımda sizce ne olabilir?

Soruları sorulur ve çocuklar tahmin etmeye teşvik edilir.

Figure 7. A cross-section of the night scenario from the manual

The manual specifies when children must use which sensor, and this directive was given to children under the supervision of the teacher and in accordance with the course of the scenario. In addition, sensor boxes were denominated according to the sensor's characteristic (analog or digital), the name of the sensor, and the section it is located in. These names were added to the directives regarding the sensor that are contained in the manual. For example, the rain sensor that would be mounted in the first section was called AR1. Moreover, this abbreviation was placed under the sensor boxes as well, to facilitate matching the sensor and holographic material.

In the formative evaluation process, the focus is on the interim evaluations in the product development process and whether this evaluation process advances in accordance with its purpose. Accordingly, decisions are made regarding what shall change in the process and what shall be added to the process (Seels and Glasgow, 1998). The material set prepared as of the end of the process was presented to Computer Education and Instructional Technologies experts and Science Education and Preschool Education experts, and their opinions were received. The opinions received from Computer Education and Instructional Technologies experts are given in Table 1, opinions received from Science Education experts in Table 2 and opinions received from Preschool experts in Table 3. The experts were coded according to their fields of expertise. Accordingly, Computer Education and Instructional Technologies experts were coded as EC1...EC4, Science Education experts as ES1...ES3 and Preschool experts as EP1 and EP2.

Table 1. Opinions received from Computer Education and Instructional Technologies experts regarding the material set

Themes	Codes	Computer Education and Instructional Technologies Experts			
		EC1	EC2	EC3	EC4
Upgradability	Ease of movement			✓	
	Wooden boxes		✓		
	Intervention of the teacher in the display	✓			
	Renewal of sensor connections	✓		✓	✓
Ease of use	Running under the guidance of a manual	✓	✓	✓	✓
	Having a detailed manual prepared	✓	✓	✓	✓
	Student communicates with a single sensor		✓		✓
	Numbers designated to sensors and the manual		✓	✓	✓
Suitability for students	Designed in accordance with the target audience	✓		✓	✓
	Practicable for individuals and groups	✓	✓	✓	✓
	Sensors designed in a way that children can understand			✓	✓
Error-free display of information	Clear images	✓	✓	✓	✓
	Images proceed in accordance with the manual	✓	✓	✓	✓
Availability of supportive material	Paying attention to the animation stream	✓			✓
	Paying attention to cognitive load	✓			
	Being interesting or motivating			✓	✓
	Addressing different senses	✓	✓	✓	✓
Allowing children to interact	Sensor-supported hologram	✓	✓	✓	✓

With respect to the opinions received from Computer Education and Instructional Technologies experts via the material evaluation form, the experts mentioned deficient aspects of the material only under the theme of upgradeability. EC1, EC2 and EC3 stated that in order not to experience disruptions due to transmission in the application phase of the connections made to the material, sensor connections must be renewed. In addition, some suggestions were made for improvement of the material, indicating that the material is heavy but should be easy to move (EC3), that the sensor boxes should be made of wood, not carton, for their durability (EC2) and that teachers must be allowed to intervene in the available displays (EC1).

EC1, EC2, EC3 and EC4 mentioned that the interactive holographic material was easy to use. All four of the Computer Education and Instructional Technologies experts favourably evaluated the preparation of activities in detail and their performance in accordance with a manual. Moreover, the fact that the numbers written under the sensor boxes are also available in the manual was found to be beneficial for the sake of sensor placement. Computer Education and Instructional Technologies experts referred to the fact that the material is appropriate for individual and group studies. Whereas the child proceeds in accordance with the directives in the manual, lending the children the opportunity to intervene in all 3 sensors for the completion of the activities ensures group study. Also, having clear images in the hologram and their flow in parallel with the manual were found critical by all the experts with respect to the process of displaying the information faultlessly. On the other hand, the experts (EC1, EC2, EC3, EC4) mentioned that the material was supported by the fact that it addresses different sense organs. In addition, it was stated that the holographic image was supported by sensors and that it was favourable for the children to interact with the material in this way.

Table 2. Opinions received from science experts in relation to the material set

Themes	Codes	Science experts		
		ES1	ES2	ES3
Presentation of information	Presentation of information incrementally in the manual	✓	✓	✓
	Giving concepts first singly and then collectively	✓	✓	
	Concepts flow based on similar scenarios and the principle of spirality	✓	✓	
Content matches scientific knowledge	Visualising the concepts in a way that children can understand	✓	✓	✓
	Structuring concepts in accordance with scientific content	✓	✓	
Division of concepts into appropriate sections	Content items being prerequisites for each other	✓	✓	✓
	Placing content incrementally	✓	✓	✓
Material supports the teaching of concepts	Supports the permanence of information	✓		
	Interaction allows children to learn through practise and experience	✓	✓	✓
	Addressing different senses	✓		✓
	Learning concepts through internalisation	✓		
	Being able to establish relations among concepts			✓
	Concretizing abstract concepts		✓	✓
	Being three-dimensional and interesting		✓	✓
Material develops inquiry skills	Questioning the situation given in the scenarios pertaining to the concept by using hints and variables	✓	✓	✓
	Observation of the process with the answers given to the questions asked in the manual	✓	✓	
	Questioning under what circumstances the concept would occur	✓	✓	✓
Material develops scientific process skills	Integration of questioning process and scientific process skills in the manual	✓	✓	✓
	Identification of scientific process steps in the generation of the manual		✓	
	Advancing the hologram under children's control		✓	

In presenting their opinions on the material evaluation form, all three Science Education experts pointed out the importance of having the information in the manual placed incrementally. Similarly, having the concepts in the manual first listed individually and then collectively shows that the information is provided in a logical order. All three experts mentioned that the concepts were formed in a way that children can understand, and ES1 and ES2 stated that the concepts were structured in accordance with scientific content. All experts agreed that incorporating the content into the activities incrementally and in such a way that each one is a prerequisite for the next was appropriate. The experts stated that the interactive holographic material set would support the learning of concepts by children because it allows them to learn by practise and experience, and concretizes the abstract concepts in a three-dimensional and interesting manner. The experts were of the opinion that the material is effective in another aspect as well, namely its ability to develop children's questioning skills. It was found to be significant that, for the sake of developing children's questioning skills, the situation given in the scenarios pertaining to the concept is queried by using hints and variables (ES1, ES2 and ES3), the process is observed through the answers given to the questions asked in the manual (ES1 and ES2) and it is questioned under which conditions the concept would occur (ES1, ES2 and ES3). Moreover, all of the experts stated that the integration of scientific process skills with the questioning process in the scenarios contained in the manual would have a positive impact on the development of children's basic scientific process skills.

Table 3. Opinions received from preschool education experts in relation to the material set

Themes	Codes	Preschool Education Experts	
		EP1	EP2
Use of clear and understandable content	Availability of phrases and visuals that fit children's developmental characteristics	✓	✓
Suitability for students	Ensuring active participation of children in the process	✓	
	Concretization that fits the developmental characteristics of children		✓
	Practicable for both individuals and groups	✓	✓
Having the nature of supportive material	Active use of scientific process skills	✓	
	Learning by discovery for children in accordance with the foundation of scientific topics	✓	
	Guidance is provided in the manual in order to address misconceptions	✓	
	Concretization of abstract concepts		✓
Having attractive content	Being related to daily life and natural events		✓
	The topics selected allow for questioning by children	✓	
Being motivating for children	Being a different material that they would come across for the first time	✓	✓
	Interaction of children with the material	✓	✓
Allowing children to interact	Learning occurs for children through practise and experience in the process		✓
	Children's achievement of the result by using the material and by giving answers	✓	
Addressing different sense organs	Supporting the process visually	✓	✓
	Supporting the process aurally	✓	✓
	Supporting the process tactually	✓	✓

In providing their opinions regarding the material set, preschool education experts favourably evaluated the fact that the material set involved phrases and visuals appropriate to the developmental characteristics of children and that the content is clear and understandable. Similarly, EP1 and EP2 stated that the material set was designed to enable both individual and group applications. In addition, under the theme of appropriateness for students, they said that the material increased the active participation of children in the process (EP1) and that the process was concretized based on children's developmental characteristics (EP2).

They mentioned that, with its aspects of supporting the learning process and arousing interest, the material set is fit for use. Under the theme of being a supportive material, they stated that scientific skills may be actively used in the process, the material ensures children learn by discovery in accordance with the foundation of scientific topics, the manual is a guide for addressing misconceptions, and the material helps concretize abstract concepts. Under the theme that the content arouses interest, the experts emphasise that the content is related to daily life and natural events and that the selected topics allow children to ask quesitons. Both of the experts mentioned that the material was designed to be practicable for both individuals and groups, and that as it is a different material that children would come across for the first time and since they would interact with the material, it would support motivation. Moreover, both of the experts favourably evaluated the fact that the material addresses the visual, aural, and tactual senses, in other words, that it supports different sense organs.

In line with the evaluations received from all the experts regarding the material set, for the purpose of carrying out the relevant process in a more sound manner, the material and the manual were provided to different preschool teachers other than the children's own teachers, and the former were asked to examine them. Afterwards, according to the feedback given by the experts, the sensor connections were renewed, and, in line

with the opinions of preschool teachers, some additional questions were added to the manual, thereby finalising the material set.

Implementation and Evaluation Phase of the Seels and Glasgow Model

This phase of the Seels and Glasgow model covers the processes of "implementation and maintenance" and "summative evaluation". What was done during these processes is presented in the relevant sections below.

Implementation and maintenance process, this step, where the designed material is implementedand its maintenance is performed and checked, is not the main implementation phase of the relevant material. The principal purpose of this process is to finalise the developed material by checking it for the main application (Seels and Glasgow, 1998). The material set was applied for 10.5 weeks (two events per week) in total in 21 activities (‘Rain’, ‘Snow’, ‘Hail’, ‘Fog’, ‘Cloud’, ‘Lightning’ etc.) within the framework of the pilot scheme, and solutions were brought to the problems found as a result of this practise. A cross-section of the problems and solutions experienced during the activities in the pilot scheme are presented in Table 4. When Table 4, which includes the problems and solutions identified in the interactive hologram-supported material set in the pilot scheme, is examined, the cables used in the sensors in all activities were converted into a single cable, and the cables were soldered to the sensor in order to prevent technical problems caused by the connection problem experienced in the process. The images and sounds in the 3D designs in the activities were revised to help children understand the content more clearly. In addition, additional questions and instructions were added to the manual, which was prepared in accordance with the scientific content, both to support the teacher's learning process and to facilitate the children’s understanding of the related activities.

Table 4. A Cross-Section of Problems Identified in an Interactive Hologram-Supported Material Set and Solutions Produced

Activities	**Identified problems**	**Solutions**
Rain	The sudden encounter of the clouds with the cold was not clearly understood.	When the clouds encountered the sudden cold, the color of the clouds was darkened, and the sound of cold air was added.
Snow	There were problems with the sensors due to loose cables.	The cables used in the sensors were converted into a single cable and soldered to the sensor.
Hail	The transformation of small raindrops into ice crystals was not clearly understood by the children; the transformation into ice crystals was only briefly visible on the screen.	The scene where small raindrops turn into ice crystals was extended to allow children to make clear observations.
Fog	The instruction in the manual for children to draw the cloud before the fog was misplaced.	The instruction to draw the cloud before the fog was removed from the manual, and only the formation of the fog was asked to be drawn. But the question "How are clouds formed?" was not addressed.
	The statement "Evaporating water encounters sudden cold near the Earth's surface" in the manual was not emphasized by the teacher.	The statement "encountering sudden cold near the Earth's surface", which should be emphasised in the manual, is highlighted in red.
Cloud	The children did not understand why the clouds were moving.	The sound of wind was added to the scene where the clouds were moving. It was added to the manual that the clouds move because of the wind.
Lightning	In order to improve the activity, the teacher had to ask additional questions during the activity.	Additional questions asked by the teacher during the activity were added to the manual after receiving expert opinions. Example: The questions "Do we first hear the sound or see the

		light of the lightning?" and "So, what could cause these surges?" and "Did the temperature go up or down?" were added.
Rainbow	Although it was observed that the rainbow consists of seven colours, the students did not learn which colours they are.	Although the colours of the rainbow are displayed in the manual, the name of each colour of the rainbow was added to the manual to give instructions to the teacher. It was also emphasised that the refraction of sunlight creates seven colours.
Night	It was determined that the answer to the question "Which of the Earth, the Sun, and the Moon is the largest?" and "Do the Earth, the Sun, and the Moon move?" should be asked earlier, according to the course of the activity.	"Which of the Earth, the Sun, and the Moon is the largest?" and "Do the Earth, the Sun, and the Moon move?" were included alongside the first questions in the manual.
Day	It was determined that the answer to the question "Which of the Earth, the Sun, and the Moon is the largest?" and "Do the Earth, the Sun, and the Moon move?" should have been asked earlier in the activity.	"Which of the Earth, the Sun, and the Moon is the largest?" and "Do the Earth, the Sun, and the Moon move?" were included alongside the first questions in the manual.
The Earth	In order to improve the activity, the teacher had to ask additional questions that are not included in the manual during the activity.	It was observed that the questions asked by the teacher helped students with comprehension. For this reason, additional questions asked by the teacher during the activity were added to the manual after receiving expert opinion. Example: Where in the world are the colours green and blue found?
Spring	In the hologram, the passage of the birds was fast, and their sounds were not clearly audible.	The passage of birds in the hologram was made continuous, and the sound of the birds was amplified.
Summer	Although it is not included in the manual, the teacher made a connection between the duration of solar radiation and the darkening of the sky in order to make it more understandable.	It was observed that the connection established by the teacher helped students with comprehension. For this reason, the statement used by the teacher during the activity was added to the manual after receiving expert opinion. Example: The more sunlight we get, the later it gets dark.

During the activities, it was observed that taking an active role in the process with the help of sensors and seeing the existing images change and hearing the sounds in the hologram were remarkable for the children. In addition, the fact that children would experience hologram technology for the first time provided them with a remarkable, fun, motivating, and intriguing environment.

In the summative (consequential) evaluation process; data are collected after application, gathered data are interpreted, and it is determined in line with these data to what extent the objectives set at the beginning of the process are achieved. At this stage, the opinions of Computer Education and Instructional Technologies, Science Education and Preschool Education experts were again sought to come up with a final decision on whether the material set was appropriate for the study group and the objectives. And in the diffusion phase, the innovations decided to be made are put into practise and disseminated. In this respect, in the diffusion phase, a holographic material set was allowed to be used in the classes of 5th degree and over in preschool institutions.

Discussion and Conclusion

When the instructional process designed based on Seels and Glasgow instructional design model is assessed, structuring of disrupted aspects within the process by the model's nature, makes a positive contribution to the material set. Gülhan ve Karsak (2014) and Şakar (2008) mentioned the fact that the computer-assisted instructional design made according to the relevant model increased the academic successes of students and process performances. Moreover, Uzunboylu and Koşucu (2017) stated that, being open to change and improvement, this model has a critical role in the achievement of the objectives set and the material selected. In this context, the process of designing and assessing the effectiveness of an interactive holographic material set is structured in line with the Seels and Glasgow model.

When the problem analysis process of the Seels and Glasgow model is focused on, it is known that the period in which children learn basic concepts is pre-school and that the concepts are acquired through the activities performed by the child or the experiences gained (Fleer, 2009; Tu and Hsiao, 2008). In this respect, it is important to make room for real-world-based materials in educational environments to allow children to make sense of items such as scientific phenomena and concepts correctly in their minds. There are conclusions in the literature that the hologram technology that allows for the display of objects from different angles (Aina, 2010), facilitates comprehension of scientific topics existing in real life and can be used in teaching concepts (Mnaathr and Basha, 2013), and that its use would be effective in the instruction of science (Olson, 2013). Moreover, the reason why materials are preferred to be prepared in three-dimensional form these days (Işık, Işık and Güler, 2008) is the fact that the real world is three-dimensional and that abstract concepts may be concretized by using three-dimensional images (Barkhaya and Halim, 2017; Eschenbrenner, Nah and Siau, 2008; Ghuloum, 2010). Generation of three-dimensional, lifelike images with the developed material set would contribute to the concretization of the difficult concepts that require a process as well as the abstract concepts. Similarly, experts state that the material in question can be used to concretize abstract concepts and support the teaching of concepts.

If the instructional activities to be carried out by using the interactive holographic material set, are designed in the light of scientific knowledge and in accordance with inquiry-based learning, this would contribute to the development of children's questioning skills. Experts also emphasise that questioning the concepts given in the manual by directing questions to children and questioning the situations in which the concept will occur will be effective in the teaching process. Similarly, it was frequently emphasised that the inquiry-based learning activities contribute to the development of students' scientific process skills (Stout, 2001; Sullivan, 2008; Şimşek and Kabapınar, 2010; Wu and Hsieh, 2006; Wu and Krajcik, 2006). Furthermore, the scientific activities prepared for children must be supported with scientific process skills, allowing them not only to learn the concepts and events but also to come up with their own knowledge (Ward, Roden, Hewlett and Foreman, 2008). However, Ergazaki and Zogza (2013) stated that preschool teachers faced challenges in performing basic scientific process steps in the activities they conducted. Therefore, it may be asserted that the manual, a guide for teachers, includes scientific information and questions aiming to develop children cognitively at the basic level, which significantly support this process. Similarly, experts underline that the manual can be used both to eliminate misconceptions and to support science process skills.

During the design process, the interaction of the teaching process with the sensors in the material set was positively evaluated by the experts. Similarly, it was found that hologram technology is used to teach real objects by being supported with different tools (Walker, 2012) and that this technology enables to establish three-dimensional interaction (Barkhaya and Halim, 2017). It was also determined in the literature that, the interaction ensured with sensors connected to the Arduino helped students understand and comprehend the lesson better (Hertzog and Swart, 2016); rendered students more active (Jawawi et al., 2015) and had a positive impact on their putting theories into practise (Slåttsveen et al., 2016). In this way, it is possible to support the learning process by allowing students to learn through practise and experience with the help of sensors placed in the material set. Moreover, the learning media supported by sensors provide the opportunity to activate different sense organs in learners (Hanson and Shelton, 2008). It is known that the more the learning activity is structured in a way to address more than one sense organ, the more permanent the learning becomes and the slower the oblivescence occurs (Dale, 1969). Accordingly, it is considered that the visuals in the material set that were prepared using Unity 3D may address different sense organs of children, together with the sounds integrated with these visuals and the sensors used.

The information being incorporated in the manual, from simple to complex and from known to unknown, is of importance for the sake of the logical presentation of information. The experts also emphasised that the scientific content in the manual as well as their presentation with phrases and visuals in the interactive

holographic material that fit the developmental characteristics of children would support the learning process. Technology-assisted materials prepared in accordance with children's developmental characteristics contribute to their academic successes in the fields of language (Liu, Tan, and Chu, 2010), reading and writing (Ihmedieh, 2010; Judge, 2005), mathematics (Own, Cai and Hung, 2022) and science (Daugherty, Dossani, Johnson and Oguz, 2014). In addition, the fact that the content was included in the activities incrementally and in a way that they would be preconditions for each other was found to be appropriate by the experts. NAEYC (2012) pointed out the importance of having the language used in the process in a way that children can understand and the presentation of new information by establishing the connection with previous information for the permanence of the learning process. In this case, it is possible to claim that the material set was duly prepared, supported by accurate directives, and developed in accordance with its purpose by establishing connections between the manual and the hologram. In addition to all these positive aspects of the material set, experts in the field of CEIT expressed some reservations about the formative assessment process of the Seels and Glasgow models. One of these reservations is that the sensor connections should be renewed and the teacher's intervention on the existing screens should be made possible in order to avoid disruptions during the implementation phase due to the transmission of the connections to the material. In addition, since the material is heavy, it was also suggested that the sensor boxes should be made of wood instead of cardboard for durability and easy transportation. In this context, in interactive hologram-supported materials, sensor connections were renewed in line with expert opinions, and it was made possible for the teacher to intervene on the screen. However, no improvements could be made due to the heavy weight of the material and the high cost of easy transportation. Similarly, making the sensor boxes out of wood would create extra weight, so they were left as they are.

In the implementation and evaluation process of the model, it was understood that the material set was easy to use, interesting, and motivating. Aino (2010) states that the hologram technology is an interesting technique used for displaying an imagined object from different angles and that this technique could be used to solve problems in education. Accordingly, since the children would experience the generation of concepts in the material set for the first time and as they would interact with the material, this might provide children with an interesting, fun, and motivating environment.

Suggestions

As it presents concepts in a real-like, three-dimensional manner, supports the process of structuring concepts in children's minds, and allows them to learn by practise and experience, this material set may create an environment that would enable children to learn by playing an active role in the process. Usually, scientific concepts are hard for children to grasp, because they are abstract, and children are more prone to concrete phenomena at this stage. Thus, the interactive holographic material set may be preferred, especially to concretize abstract concepts. Furthermore, this material set may also be used to address the lack of materials in the teaching process of scientific concepts during the preschool period.
The fact that the material set is connected via cables and that it cannot be controlled remotely may be a disadvantage for teachers who are adapting to new technology. Accordingly, adding a remote-control feature to the hologram technology by using Bluetooth technology may be a useful update to allow for teachers' remote control. Moreover, in order to make the material more ergonomic, it may be made of lighter materials such as polycarbonate, polymer, and mica. Similar materials may be used to enhance the strength of the sensor boxes.

The developed material set was designed for preschool children of 60 months and above. It may be proposed to the researchers who will conduct studies in this field to extend the scope of application of the material set in a way to include other levels. In addition, researchers may prefer the Seels and Glasgow model, which is open to revision and change to develop quality and permanent products.

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Author's (s) Contribution Rate

The doctoral dissertation from which this article was produced was written by the first author under the supervision of the second author. The entire manuscript was examined by the second author during the article preparation process, and any necessary changes and corrections were made before it was ready to be submitted.

Conflicts of Interest

All authors declare no competing interests.

Ethical Approval

Research permit approval was received for this study from the Giresun Governorate Ministry of National Education (Date: 23.07.2018, Issue: 29409993-605.01-E.13656345)

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Effects of the Teachers' Personality Traits and Job Satisfaction on Their Attitude towards Distance Learning in Turkey

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Abstract

The COVID-19 pandemic caused an alteration in many industries. The utilisation of distance learning opportunities has rapidly increased. This study aimed to evaluate teacher attitudes towards distance learning and demonstrate the effects of their personality traits and job satisfaction on their attitudes and the relationship among these factors. This cross-sectional study was conducted through an online questionnaire. Four hundred sixty-four teachers from several schools, different units and fields of study attended the research. The data was collected via the Introductory Information Form, Attitude Scale Towards Distance Learning (ATDL), Big Five Personality Traits Scale (BFPTs), and Job Satisfaction Scale (JSS). When the total points from the attitude scale towards distance learning are compared, there is no significant difference in gender, branch, institution, or working at the weekends, but age, educational background, having a child, and income satisfaction have a significant effect. There was no relation between any personality trait and attitude towards distance learning. Because variables such as age and income satisfaction affect the attitude towards distance learning, changeable variables emerge. It is essential to support older teachers in technology use. Making necessary alterations in teachers' incomes should be considered an essential factor. The reasons for the fact that teachers still prefer in-person education should be investigated. Physical condition sufficiency can be related to the perception of distance education qualification, and a sufficient technological structure can contribute positively.

Keywords: Distance learning, Online teaching, Teacher's attitude, Job satisfaction.

Introduction

'Technology is a complex structure in which management, processes, and machines are integrated with human organisations.' (İşman, 2011). With technology entering all areas, from communication to education, an obligation to use technology in every field occurred for the people of the information society in the 21st century (Taşdemir, 2018). From the past to the present, the social structure has become its current structure of 'information and communication' by going through the processes of hunting, gathering, and industrialization with technological acceleration (Güneş, 2016).

Education plays a significant role in the development of society. Today, people of all ages use technology daily, and this heavy increase in technology use affects the education system (Akkoyunlu & Erkan, 2013). The place of technology in the education system has become more of a facilitator tool than a purpose itself. Every structure of the learning process includes technology (Akkoyunlu & Erkan, 2013). For this purpose, society, especially teachers, should adopt technological innovations and try to learn and bring these innovations into the learning process (Kılıçer, 2008). At the same time, knowledge has a way of being consistently refreshed and renewed. In this sense, one of the main objectives of every education system is to get those who raise individuals to follow the latest innovations and be informed about the requirements of the learning process (Raja & Nagasubramani, 2018).

Since the teachers show people how to use their knowledge, they should have the knowledge and technology necessities of the time and keep up with the changes and innovations during the process (Yilmaz, 2007). If teachers integrate technology into education, it will allow for a more productive learning process (Yilmaz, 2007). During this process, teachers are the ones that teach how to reach and use endless knowledge instead of directly giving the existing knowledge (Skorikova et al., 2016). In a world where every aspect of

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communication, scientific research, production, change, and education grows globally, it is an excellent opportunity to have 'global distance education for educators' (Şişman, 2011). During global distance learning, education has become more of a lifelong term and not a terminal one for individuals. In this sense, owing to technology, it has transferred from being passive and reactive to being interactive and enterprising (Raja & Nagasubramani, 2018).

It is inevitable to customise education for students, just like customised products. One of the essential aspects of distance education is that it can be customised for the individual (Moller & Soles, 2001). With distance education, distance is no longer a problem, and with the new technologies, the generation gap started to disappear (Anderson & Dron, 2011). In distance education, learning can be achieved by individuals or groups, and a teacher does not physically exist. Distance learning materials are structured as facilitators for learning (Mielke, 1999). On the other hand, it is impossible to perform some classroom tasks in distance education. For example, classroom assessments and atelier activities cannot be performed during distance education (Borisova et al., 2016).

Distance learning is student-centred learning. The aim is to provide a productive learning process for students. Student productivity in the process is correlated with the teacher's knowledge. Teachers' ability to integrate active learning techniques into distance learning is wholly related to student satisfaction and learning (Zaborova et al., 2017). During distance education, the teacher's knowledge of the student's motivators and achievements increases efficiency in distance learning (Galusha, 1998).

On the other hand, teachers' responsibility for redefining and adapting knowledge increases in the information age, where knowledge is consistently changed and renewed. The teacher introduces the learning process, so it is inevitable so she or he will not share in the success or failure of the process. Teachers' satisfaction and motivation will be effective for the success of the process (Tan, 2003).

Lately, the COVID-19 pandemic has affected the whole world and caused an alteration in many industries. The education system's utilisation of distance learning opportunities has rapidly increased. Restrictions for crowded and indoor areas have necessitated a rapid transition to distance learning in all education stages. Because distance learning entered the education process at this speed, it became crucial to research factors affecting attitudes towards it. In Turkey, no research analyses teacher views and attitudes on the subject in our study.

The current study aims to evaluate teacher attitudes towards distance learning and demonstrate the effects of their personality traits and job satisfaction on their attitudes and the relationship among these factors.

Method

Study Design and Sampling

This study had a cross-sectional and descriptive design. We used an online survey to minimise in-person interactions with all participants during the pandemic. A convenience sample of teachers was contacted to participate in this study. Researchers directly contacted the teachers they know at every level and asked them to share this survey in their social networks (organisations or workgroups on platforms like WhatsApp and Facebook). This way, the survey was shared on various social network groups to gather teachers who give lectures at any level. Participants were also asked to share the survey directly with their colleagues and the teachers and lecturers they knew.

The respondents are 464 teachers from public schools, private schools, different units, and different fields of study. Introductory Information Form, Attitude Scale Towards Distance Learning (ATDL), Big Five Personality Traits Scale (BFPTs), and Job Satisfaction Scale (JSS) were used as data collection tools. The data was collected online from 15 April to 15 May 2020. The sample size did not calculate; instead, every completed survey form in this one month was included in the study. Before collecting the data, all respondents were informed about the aim of the study, data privacy, and the intended scientific use of the data. Informed consent was received from all respondents. To carry out this study, XXX University's clinical research ethics committee received approval (28.05.2020/2020-04).

Data Collection Tools

Introductory Information Form: This form was designed by the researchers and included demographic questions such as gender, age, educational background, marital status, and having a child. It also includes professional practise-oriented questions such as institution (private-public), monthly income, income satisfaction, professional seniority, branch, and working hours/days. Regarding technology use and distance learning, the questions of technology sufficiency, informing about distance learning, physical conditions for distance learning, sharing problems in distance learning, getting support from authorities, and preference between in-person and distance learning were addressed.

Attitude Scale Towards Distance Learning (ATDL): The 'Attitude Towards Distance Learning' scale, developed by (Ağır, 2007), was used online to evaluate teachers' attitudes towards distance learning. The scale was structured as a five-point Likert scale; it consists of two sub-dimensions (advantages of distance learning and

constraints of distance learning) and 21 items. The scale's minimum point is 21 and the maximum point is 105. Also, for the first sub-dimension, the 'advantages of the distance learning minimum value are 14, and the maximum value is 70; for the second sub-dimension, 'the constraints of the distance learning minimum value are seven, and the maximum value is 35.

The Big Five Personality Traits Scale (BFPTs): The BFPTs are commonly used in measuring individual personality types (Costa & McCrae, 2008). In the BFPTs, each personality type explains the factors influencing an individual's behaviour, which were categorised into Extraversion, Conscientiousness, Agreeableness, Openness, and Neuroticism Personality Type. A Turkish adaptation study was conducted by Horzum et al.; in 2007.

Statistical Analysis

The data were analysed using SPSS-22 (IBM Corp., Armıonk, NY, ABD) software. Frequency tables were formed for the sociodemographic questions and scale items. In order to see the differences between the mean points of normality tests and sociodemographic questions, two parametric independent samples t-tests and ANOVA analysis were used.

For the scales unsuitable for the normality tests, non-parametric Kruskal Wallis and Mann Whitney U analyses were made. Pearson correlation analysis was performed on the standard distribution tests to reveal the relation between the attitude towards the distance learning scale and other scales and variables, and Spearman correlation analysis was performed on the non-normal distribution tests. Using simple linear regression, regression analysis was used to see variables and scales' effects on the attitude towards the distance learning scale. All analyses were performed at a level of $\alpha = 0.05$.

Results

General Characteristics of the Participants

Four hundred sixty-four teachers from different branches participated in the study. Among the participants, 320 (37.7%) were women, and 144 (62.3%) were men. One hundred eighteen participants (25.4%) were aged between 20-30, 211 participants (45.5%) were aged between 30-40, and 95 participants (20.5%) were aged between 40-50. 340 (73.3%) were married, and 124 (26.7%) were single. Three hundred twenty participants (69%) work in a public school, and 144 (31%) work in a private school. 357 (76.9%) have an undergraduate degree, 85 (18.3%) have a postgraduate/doctorate, and 22 (4.7%) have an associate degree. The other sociodemographic and professional traits of the teachers are demonstrated in Table 1.

Table 1: Sociodemographic attributes of the teachers

Questions	**Answers**	**n**	**%**
Gender	Female	320	69.0
	Male	144	31.1
Marital status	Single	124	26.7
	Married	340	73.3
Having a child	Yes	300	64.7
	No	164	35.3
Age	20-30	118	25.4
	30-40	211	45.5
	40-50	95	20.5
Institution	Private School	144	31.0
	Public School	320	69.0
Branch	School counsellor	40	8.6
	Science and Technology	43	9.3
	Primary school teacher	121	26.1
	Turkish / Turkish literature	39	8.4
	Social sciences	34	7.3
	Mathematics	30	6.5
	Applied sciences	43	9.3
	Foreign languages	57	12.3
	Preschool teaching	57	12.3
Professional seniority	0-5 years	90	19.4
	6-10 years	119	25.6
	10-19 years	151	32.5
	20 years and above	104	22.4
Educational background	Associate degree	22	4.7
	Undergraduate	357	76.9
	Postgraduate / Doctorate	85	18.3

	Yes (1-2 days)	76	16.4
Working at the weekends	Yes (3 days and more)	86	18.5
	No	302	65.1
	Not at all	45	9.7
	No	87	18.8
Satisfied with the salary	In-between	189	40.7
	Yes	118	25.4
	Very much	25	5.4

52% of the teachers answered the question of their qualification in distance learning as 'qualified' or 'highly qualified". However, only 25% of the teachers answer the question of the educational qualification in distance learning as 'qualified' and 'highly qualified. Most teachers (80%) stated there were unqualified physical conditions for distance learning. Regarding their preferences between in-person and distance learning education, nearly all teachers (95%) said they would prefer in-person education. Teachers' answers to distance learning-related questions are demonstrated in Table 2.

There is no significant difference among the participants' answers to their qualifications in distance learning regarding marital status, professional seniority, branch, age, and working at the weekend variables. Educational background (the postgraduate/doctorate group has a significantly higher mean point than the undergraduate group), having a child (the group without a child has a significantly higher mean point than the group with a child), gender (the male group has a significantly higher mean point than the female group), and institution (the private school working group has a significantly higher mean point than the public-school worker group). Te variables of income satisfaction (the very much satisfied group has a significantly higher mean point than all other groups) were found to be significantly related to the thought of being sufficient for distance learning ($p< 0.05$).

Table 2: Teachers' answers to questions about distance education

Questions	**Options**	**n**	**%**
	Highly unqualified	4	0.9
	Unqualified	28	6
How qualified do you see yourself about technology?	Intermediate	173	37.3
	Qualified	192	41.4
	Highly qualified	67	14.4
	Highly unqualified	9	1.9
	Unqualified	45	9.7
How qualified do you see yourself about distance education?	Intermediate	169	36.4
	Qualified	184	39.7
	Highly qualified	57	12.3
	Highly unqualified	30	6.5
How qualified do you see the education and informing during the distance education?	Unqualified	88	19
	Intermediate	213	45.9
	Qualified	109	23.5
	Highly qualified	24	5.2
	Highly unqualified	54	11.6
How qualified do you see the physical conditions for distance education?	Unqualified	140	30.2
	Intermediate	186	40.1
	Qualified	70	15.1
	Highly qualified	14	3
	Definitely in person education	383	82.5
In general, which one do you prefer: in person education or distance education?	In person education	49	10.6
	Hesitant	26	5.6
	Distance education	2	0.4
	Definitely distance education	4	0.9
	No	36	7.8
Are you able to share your experiences/problems in distance education with your colleagues?	Yes, but not enough	222	47.8
	Yes	206	44.4
	No	50	10.8
Are you able to get support from your superiors/authorities about your problems related to distance education?	Yes, but not enough	190	40.9
	Yes	224	48.3

The Severity of Measurements and Differences between Groups

When the total points from the attitude scale towards the distance learning scale according to sociodemographic variables are compared, there is no significant difference in gender, branch, institution, or working weekends ($p>0.05$). (Table 3)

On the other hand, when age, educational background, having a child, income satisfaction, and attitude towards distance learning scale are compared, there is a significant difference between the groups ($p<0.05$). According to the results, the attitude towards distance learning scale total point is significantly higher for the 20-40 age group than for the 40-50 and 50 and older age groups. Considering the institution variable, in the advantage subscale, there is a significant difference between private school workers' total points and public school workers' total points, but this difference cannot be seen on the full scale. Considering the income satisfaction variable, the group that answered the question with 'yes' has a significantly positive attitude towards distance learning ($p<0.05$). When attitude towards distance learning is examined through the professional seniority variable, the mean point of the group with 1-5 years of seniority is significantly different and higher than the mean point of the group with 11-19 years and 20 years or more of seniority and the mean point of the group with 6-10 years of seniority is significantly different and higher than the mean point of the group with 20 years or more of seniority ($p<0.00$).

Job satisfaction scale points were evaluated regarding sociodemographic traits, and only income satisfaction was found to be a significant variable; age, institution, educational background, professional seniority, and having a child did not present a significant difference ($p<0.05$). The analysis results are given in Table 3.

Table 3: Difference test results of attitudes towards distance learning and job satisfaction in terms of sociodemographic traits

Variables	n	Attitude Scale Towards Distance Learning			Job Satisfaction Scale		
		Advantage	Constraints	Total	Qualification suitability	Development opportunity	Total
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age							
20-30	118	2.69±.73	2.56±.93	2.65±.58	3.89±.68	4.09±.69	3.96±.58
30-40	211	2.54±.74	2.55±.99	2.54±.59	3.95±.65	4.03±.62	3.98±.57
40-50	95	2.17±.76	2.72±1.08	2.36±.60	3.91±.64	3.89±.66	3.90±.56
50+	40	2.27±.63	2.83±.96	2.46±.42	3.97±.73	3.94±.82	3.96±.69
Total	464	2.48±.76	2.61±.99	2.52±.58	3.93±.66	4.01±.66	3.95±.58
		f:10.277	f:1.417	f:4.812	f:.231	f:1.803	f:.320
		p: <.000	p: .237	p: <.003	p: .874	p: .146	p: .811
Educational background							
Associate degree	22	2.52±.62	2.69±.90	2.58±.50	4.06±.63	4.17±.69	4.10±.58
Undergraduate	357	2.43±.77	2.61±1.02	2.49±.59	3.94±.65	4.01±.65	3.97±.57
Postgraduate	85	2.69±.72	2.61±.89	2.66±.56	3.83±.69	3.99±.73	3.89±.62
Total	464	2.48±.76	2.61±.99	2.52±.58	3.93±.66	4.01±.66	3.96±.58
		f:4.404	f:.082	f:3.349	f:1.532	f:.665	f:1.350
		p: .013	p: .921	p: .036	p:.217	p: .515	p: .260
Institution							
Public School	320	2.43±.79	2.67±1.01	2.51±.59	3.94±.66	3.94±.67	3.94±.59
Private School	144	2.59±.66	2.49±.94	2.56±.56	3.91±.66	4.17±.61	4.00±.56
		t: -2.357	t: 1.768	t: -0.899	t: 0.461	t: -3.600	t: -1.084
		p: .019	p: .078	p:.369	p:.645	p:.000	p:.279
Salary satisfaction							
Not at all	45	2.33±.83	2.66±1.22	2.44±.61	3.63 ±.78	4.09±.76	3.79±.70
No	87	2.48±.80	2.51±.93	2.48±.61	3.78±.63	4.03±.68	3.87±.55
In-between	189	2.38±.73	2.65±1.06	2.47±.56	3.92±.67	3.96±.66	3.93±.59
Yes	118	2.69±.72	2.59±.82	2.66±.56	4.04±.56	4.02±.63	4.03±.52
Very much	25	2.49±.69	2.66±1.06	2.55±.58	4.51±.37	4.19±.65	4.40±.42
Total	464	2.48±.76	2.61±.99	2.52±.58	3.93±.66	4.01±.66	3.96±.58
		f:3.670	f:0.352	f:2.339	f:9.861	f:0.939	f:5.924
		p:.006	p: .843	p:.044	p: .000	p: .441	p: .000
Professional seniority							
1-5 years	90	2.74±.71	2.58±.94	2.69±.57	3.88±.68	4.10±.69	3.96±.59

6-10 years	119	2.57±.73	2.41±.89	2.52±.56	3.92±.64	4.02±.62	3.95±.55
11- 19 years	151	2.45±.78	2.70±1.05	2.53±.61	3.92±.67	3.99±.67	3.95±.60
20 years and above	104	2.19±.71	2.75±1.03	2.38±.55	3.98±.66	3.96±.68	3.97±.59
Total	464	2.48±.76	2.61±.99	2.53±.58	3.93±.66	4.01±.66	3.96±.58
		f:9.674	f:2.821	f:4.597	f:.383	f:.886	f:.050
		p:<.000	p:.039	p:<.003	p: .765	p: .448	p: .985
Having a child							
No	164	2.63±.71	2.58±.92	2.62±.54	3.92±.65	4.10±.66	3.99±.56
Yes	300	2.40±.77	2.63±1.03	2.47±.60	3.93±.67	3.96±.66	3.94±.59
		t: 3.241	t: -.472	t: 2.539	t:-.097	t: 2.248	t:.825
		p:<.001	p: .638	p:.011	p: .923	p:.025	p: .410

When the relation between personality traits and attitude towards distance learning is analysed, we can see no relation between any trait and attitude towards distance learning. The analyses related to Table 4 results are given.

Table 4. Relationship between Big Five-Factor Personality Traits, Distance Learning, and Job Satisfaction

Variables	Test	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Advantage	r	-.030	.037	-.017	-.022	-.104*
	p	.524	.431	.708	.640	.024
Constraints	r	.182**	.073	.131**	.024	.052
	p	.000	.114	.005	.608	.265
Attitude Scale Towards Distance Learning Total	r	.078	.073	.059	-.005	-.061
	p	.094	.114	.203	.908	.188
Qualification suitability	r	-.292**	-.176**	-.281**	.259**	-.108*
	p	.000	.000	.000	.000	.020
Development opportunity	r	-.342**	-.177**	-.388**	.260**	-.217**
	p	.000	.000	.000	.000	.000
Job Satisfaction Scale Total	r	-.352**	-.201**	-.363**	.295**	-.166**
	p	.000	.000	.000	.000	.000

** indicates p < 0.001
* indicates p < 0.05

To evaluate distance learning attitude predictor variables, we assessed age, educational background, income satisfaction, job satisfaction, and personality traits with multiple regression analyses. Age, job satisfaction, and income satisfaction are significant predictors. On the other hand, educational background and personality traits were ineffective. The analysis results are given in Table 5.

Table 5: Distance learning predictor variables

Variables	B	Std. Error	Beta	p
Age	-.169	.067	-.116	.012*
Educational background	-2.711	2.661	-.094	.309
Income satisfaction	4.092	1.414	.146	.004*
Job satisfaction	-.200	.080	-.140	.013*
Extraversion	.708	.403	.094	.080
Agreeableness	.649	.448	.071	.148
Conscientiousness	.312	.428	.039	.467
Neuroticism	.353	.379	.048	.352
Openness	-.520	.353	-.071	.142

Discussion

Considering today's technological improvements, the contribution of digitalization to education is inevitable. The progress in distance education platforms is the most crucial indicator of this situation. This study analyses

the factors affecting teachers' attitudes towards distance learning.

Nearly half of the teachers (52%) said they qualified for distance education. This finding shows that the other 48% still think they need advanced training and support in distance education. Also, only 25% of teachers think that distance education is sufficient. In the studies on the sufficiency of distance education, it was stated that distance learning could make a significant contribution to academic success (Karabatak et al., 2020); (Ünal, 2017); (Shonola et al., 2016). In order to improve teachers' motivation towards distance education, they may need to be more informed about this education model's sufficiency. Another important finding is that nearly all teachers preferred in-person edication to distance education. Reasons for this preference and actions to be taken are essential assessment areas. Lack of necessary physical conditions, the thought of short-distance learning, and limitations on student interactions may be the reasons for this preference.

Remarkably, teachers' thoughts on their qualification in distance learning change according to variables such as educational background, having a child, being a male teacher, the institution, and income satisfaction. Advancement in the educational background is positively related to being qualified in distance learning. This finding may lead to the idea of further assistance for associate degree and undergraduate groups in distance education. Private school teachers' thoughts of being more qualified might be related to sufficient physical conditions. Remarkably, teachers' thoughts on their qualification in distance learning change according to variables such as educational background, having a child, being a male teacher, the institution, and income satisfaction. Advancement in the educational background is positively related to being qualified in distance learning. This finding may lead to the idea of further assistance for associate degree and undergraduate groups in distance education. Private school teachers' thoughts of being more qualified might be related to sufficient physical conditions. It is stated that higher technological opportunities can affect the attitude towards distance learning in a positive way (Karabatak et al., 2020). Another remarkable finding is that male teachers are more qualified than female teachers. In the literature, results support this finding and a contrary one (Kırali & Bülent, 2016). This difference may be generated by male teachers' predisposition towards technology (Graham & Jones, 2011); (Berkant, 2013). The educational seminars should consider these factors to increase distance learning sufficiency.

When factors affecting attitude towards distance education were analysed, age, educational background, not having a child, being satisfied with the income, and having less professional seniority were found to be effective. On the other hand, gender, branch, and institution variables did not significantly affect attitudes towards distance education. Younger teachers have a more positive attitude towards distance education; with the advancement of their educational backgrounds and rise in income satisfaction, their attitude towards distance education changes more positively. There are no significant differences in the attitude towards distance learning between female and male teachers, even though female teachers see themselves as more unqualified than male teachers. Some studies report that female teachers have a more negative attitude towards distance education (Turgut et al., 2017); however, our findings emphasise a difference in the qualification perception, not the attitude towards distance education (Ateş & Altun, 2008). The sources for the female teachers' perception of being unqualified in distance learning should be examined in further studies.

In the same way, the institution variable is found to be influential on qualification perception but ineffective on attitudes towards distance education. According to this result, private and public school teachers have nearly the same attitude towards distance education but feel differently about their qualifications in distance educaiton. For qualifying perception differences, physical conditions can be important factors. Our study found that teachers' branches do not affect the attitude towards distance education. There are different results in the literature. It was stated that the teachers of technology-related branches show a more positive attitude towards distance learning (Yılmaz & Güven, 2015). However, this factor might become less effective considering technology has recently entered all areas and spaces.

When the attitude towards distance education and personality traits are analysed, one can see no relation between attitude and personality traits. This is an important finding. Notably, the teachers' attitudes were not affected by their personality traits, but other changeable variables were influences on their attitudes.

Considering that age, income satisfaction, and professional seniority affect the attitude towards distance education, teachers may need more supportive training with increasing age. Besides, to increase the sufficiency of distance education, side incomes may lead to a more positive attitude and enhance the quality of distance learning.

Our study has some limitations. First, our research was conducted online. At the same time, the scales are self-rated, which makes it possible for the participants to misunderstand and answer the questions incorrectly. Another limitation of ours is that the study was conducted in cross-sectional time. Long-term and follow-up studies are needed in this area.

Conclusion and Recommendations

In this study, we analysed the factors affecting teachers' attitudes towards distance learning, and the result is that personality traits are not significant. Besides, because variables such as age and income satisfaction affect attitudes, changeable variables emerge. It is essential to support older teachers in technology use. During the distance learning course, making necessary alterations in teachers' income should be considered an essential factor.

The reasons for the fact that teachers still prefer in-person education should be investigated thoroughly. Academic studies on distance learning sufficiency can be used as an incentive in this context.

Physical sufficiency can be related to the perception of a distance education qualification. For this, a sufficient technological structure can positively contribute to the attitude towards distance learning.

Author (s) Contribution

SA, ZBA, AB; design, data collection, writing, final approval.

AB, BU, SC; statistics of data, writing, final approval,

Conflicts of Interest

All authors declare that there are no potential conflicts of interest.

Ethical Approval

Ethical permission (28.05.2020/2020-04) was obtained for this research from Kent University's clinical research ethics committee.

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Instruction of Safety Skills for the Individuals with Intellectual Disabilities

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Instructıon of Safety Skılls for The Indıvıduals wıth Intellectual Dısabılıtıes*

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Abstract

This study aims to develop a valid and reliable assessment tool for the assessment of safety skills of individuals with intellectual disabilities, examine the effectiveness of the Safety Skills Instruction Program (SSIP) in teaching safety skills to these individuals, determine the preservation of skills after instruction by observation, and determine the views of parents and students respecting the teaching of safety skills. This research is designed in an explanatory sequential design, which is one of the mixed research methods. The examination of the construct validity process has indicated that the Safety Skills Test (SST) has a structure of four factors. 540 individuals with intellectual disabilities participated in the development of the measurement tool, and 32 individuals with intellectual disabilities participated in the implementation of the curriculum. It is determined that the level of safety skills of the students with mild intellectual disabilities who have attended the instruction is higher than the ones who have not attended, according to the mean ranks. It is found that the safety skills of students are preserved at a rate of 85–85%, according to the observation data gathered one week later. According to the result of the interview data, students and parents feel pleased about the instruction and think that the skills have been learned to a large extent.

Keywords: İndividual with intellectual disability, Safety skills, Behavioral skills training, İnstruction with a board game

Introduction

Safety skills, which are among the skills necessary for individuals to lead their lives independently, include pedestrian safety, prevention of home accidents, first aid, use of emergency numbers, fire safety, and protection from abuse (Gast et al., 1992; Mechling, 2008; Jang et al., 2016). Due to the widespread use of social media among children and young people, internet safety has also become an important safety skill that needs to be taught.

When it comes to safety skills, children with intellectual disabilities (ID) are especially at higher risk of sexual abuse and other dangers (Sherrard et al, 2004; Tang & Lee, 1999). Therefore, it is important to develop effective prevention and intervention methods for these individuals. Literature reveals that safety skills are taught by several instruction methods, like errorless teaching (Batu et al., 2004), direct instruction (Christensen et al., 1996), game-based teaching (Coles et al., 2007; Foxx et al., 1984), video modeling (Bevill & Gast, 1988), social stories (Kutlu & Kurt, 2017; Kutlu, 2016; Süzer, 2015), and behavioral skills training (BST) (Bevill & Gast, 1998; Ergenekon & Çolak, 2019; Matson, 1980a).

Among these methods, BST is most frequently preferred (Bevill & Gast, 1998; Ergenekon & Çolak, 2019; Mechling, 2008). BST is a teaching method that allows the student to rehearse the behavior by providing more than one opportunity for modeling after presenting clear and concrete instructions regarding the skill and then aiming to shape the behavior with reinforcing and corrective feedback. (Stewart et al., 2007). BST generally includes discussion, role-playing rehearsal, and corrective feedback stages in teaching behaviors (Bevill & Gast, 1998; Dixon et al., 2010).

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Another preferred method for teaching safety skills is game-based teaching (Foxx et al., 1984; Padgett et al., 2006). Some types of games used in teaching safety skills to children are scribbling activities used to teach interpersonal boundaries, therapeutic games using various toys that refer to the concept of safety (Cavett, 2017), and teaching with board games (Foxx et al., 1984). This research contains the safety skills instruction program, which includes BST and board games as enhancement activities together.

While preparing individuals with disabilities to function independently in the least restrictive environment, it is necessary to ensure that they have the necessary skills to avoid dangers and to react appropriately when dangerous situations occur (Collins, Wolery, & Gast, 1991). As individuals with disabilities begin to function more independently and receive less support in the skills necessary to sustain their lives, they are more exposed to potential danger situations, and the need for appropriate teaching of safety skills to these individuals increases (Gast et al., 1992; Spivey & Mechling, 2016). Literature reveals that one or more of the safety skill areas, such as pedestrian safety, prevention of home accidents, first aid, appropriate reaction to strangers' traps, fire safety, and the use of emergency numbers, are taught together (Clees & Gast, 1994; Mechling, 2008; Jang et al., 2016). In the literature, no research has been found in which the comprehensive teaching of safety skills with BST was supported by game activities, the students were taught as a group, the assessment was made with a valid and reliable measurement tool, and the results were supported by observation and interview data. Therefore, it was necessary to conduct such a study. This research is very important in terms of developing a measurement tool, teaching safety skills as a whole with group teaching, evaluating the information learned at the end of the teaching with a standard assessment tool and in practice, and including interview data for practice. In addition, it is also important that the measurement tool developed and validity and reliability analyses performed in the study, the curriculum based on BST, and the box game can be used by other researchers and teachers involved in the implementation.

The Purpose of the Study

This study aims to develop a valid and reliable measurement tool to assess the safety skills of individuals with ID related to accidents, first aid, personal safety, and emergency numbers; to examine the effectiveness of the Safety Skills Instruction Program (SSIP) in teaching safety skills to these individuals; and to determine the post-teaching researcher's observations and the views of students and parents on teaching.

In line with this general purpose, the following sub-objectives were examined:

1. What is the level of validity and reliability of SST in the assessment of the safety skills of individuals with ID?
2. Were there significant differences between the pretest scores, pretest-posttest scores, and post-test scores of the individuals who participated and did not participate in the SSIP, applied to individuals with ID?
3. According to the results of the observational assessment after the instruction, what is the level of preservation of the safety skills of the individuals with ID regarding accidents, first aid, personal safety, and emergency numbers?
4. What are the views of parents and students on teaching safety skills related to accidents, first aid, personal safety, and emergency numbers?

Method

Research Design

This research was designed with a mixed-methods explanatory sequential design and consists of five stages: (1) The development process of SST; (2) The implementation process of SSIP; and (3) The process of observing the level of application of safety skills by individuals with ID (4) The interview process regarding SSIP; and (5) The process of data merging.

Sample

In the first phase of the research, during the development of the SST, 540 students with ID in various provinces of Turkey participated. For exploratory factor analysis (EFA), 340 data points were collected, and EFA was

performed on the remaining 328 after the extreme values were removed. 200 data points were collected for confirmatory factor analysis (CFA).

Half of the participants in the EFA study group are in the 11–15 age range, 26.8% are in the 16–19 age range, and 23.2% are in the 6–10 age range. 172 of the participants are female, and 156 are male. The majority of the participants (85.7%) do not have any additional disabilities. Half of the participants attend inclusive education (51.2%), while the other half attend a special education classroom (19.2%), a Special Education Practice Center (13.1%), and a Special Education Vocational School (16.5%).

More than half of the participants in the CFA study group were between the ages of 11-15 (57.5%), 29.5% were between the ages of 16 and 18, and 13% were between the ages of 6 and 10. 89 of the participants are female, and 111 are male. The majority of the participants (87.5%) do not have any additional disabilities. While more than half of the participants attend inclusive education (68.5%), 11% attend a special education classroom, and 20.5% attend a Special Education Center.

In the second stage, the implementation process of SSIP consisted of a total of 32 (16 in the experimental group, 16 in the control group) students with mild ID, aged 7–16, attending special education classes and a special education center.

In the third stage, observational data regarding the display of safety skills by the experimental group was collected after implementation. In the stage phase, interviews were conducted with the experimental group through the focus group technique and with their parents through individual interviews.

In the fourth stage of the study, interviews were conducted with the students who participated in the experimental dimension of the research through focus group interviews and the parents through individual interviews, in which their opinions were obtained about SSIP. Three of the parents in the study group participated in the study with their two children with mild ID, and 13 parents were interviewed. Two of the parents are fathers, and 11 are mothers. The ages of the fathers are 43 and 45, and both are primary school graduates. The ages of the mothers vary between 33 and 45, with 3 of them high school graduates, 7 of them primary school graduates, and one of them secondary school graduates.

Data Collection Tools

Three types of data collection tools were used in this study: (1) the SST, (2) the Safety Skills Observation Record Form, and (3) the Student and Parent Interview Forms.

(1) ***Safety Skills Test (SST):*** In the first stage of the study, the following steps were followed in the validity and reliability procedure of the SST: (a) literature review, scenario, and item pool formation; (b) arranging the measurement tool in a ranking scale, allowing the questions to be marked as "1-Knows" or "2-Does Not Know" to determine the students' safety skills at the knowledge level, (c) obtaining an expert opinion and content validity; (d) EFA; (e) CFA; and (f) KR-20 and Cronbach Alpha (α) reliability analysis.

(2) ***Safety Skills Observation Record Form:*** The Security Skills Observation Registration Form was prepared based on the scenarios in the SST and SSIP to record the observations of the students' display of their safety skills in the simulation environment.

(3) ***Student and Parent Interview Forms:*** Interview forms were prepared to get the opinions of parents and students about SSIP. In the forms, the participants were asked about which safety skills were learned, their thoughts on the instruction, and the importance of teaching safety skills.

Safety Skills Instruction Program (SSIP)

The instruction program on safety skills for individuals with ID in this study was organized as a program based on the scenarios included in the measurement tool and consists of two parts: a BST and a board game.

The SSIP consists of safety skill areas like (1) accidents, (2) first aid, (3) personal safety, and (4) safety skills related to emergency numbers. The stages of the first part of the instruction are as follows: (1) explaining the skill to the participants; (2) rehearsal, role-playing, and giving feedback; and (3) independent practice.

In the second part, an activity to support the instruction with a board game set covering the areas of safety skills in SSIP was included. The game consists of a 43-step track, game and information cards, guiding notes on the track, and a dice.

Data Collection

(1) ***Data Collection for the Development Process of the SST:*** Between 2018 and 2020, the SST was applied by researchers and teachers to students with IDs aged 6–19 in various cities in Turkey. The questions in the SST were read to the students by the practitioners, and the answers of the students were recorded in the forms.

(2) ***Data Collection for the Implementation Process of SST:*** The SST, developed in the first stage of the research, was applied as a pre-test and post-test in the second stage.

(3) ***Data Collection for the Observation Process for the Participants' Levels of Implementation of Safety Skills:*** In the third stage of the research, observation data were collected in the experimental group in the simulation setting by following the skill steps in the SSIP within the week following the instruction. During the observation periods ranging from 5:07 to 12:20 minutes, scenarios were read to the participants and their situations of displaying the relevant safety skills were recorded on video. The recordings were monitored by two observers, and data were collected using partial-interval recording. The videos were divided into 30-second intervals, and it was recorded on the forms whether the student performed the relevant safety skill within this time interval after the instruction was given.

(4) ***Data Collection for the Interview Process Regarding SSIP:*** In the fourth stage, the opinions of the parents on the teaching of the safety skills applied in this research were determined through semi-structured individual interviews; the opinions of the students were taken through the focus group interview.

Data Analysis

(1) ***Data Analysis for the Development Process of SST:*** In the first stage of the research, data were collected with the SST, the items of which were formed as a result of the literature review and expert opinion, and EFA, CFA, validity, and reliability studies were carried out. This process took place in five stages: (a) determining the difficulty and distinctiveness parameters of the items; (b) EFA; (c) examining the item difficulty and discrimination parameters one more time for the items planned to be included in the final version of the form; (d) CFA; and (e) reliability analysis. M-Plus version 7.1 was used in EFA and CFA analyses.

(2) ***Data Analysis for the Implementation Process of SST:*** In the second stage of the research, the effectiveness of SSIP was analyzed through relational descriptive analysis. Although the data obtained from pre-test and post-test measurements showed kurtosis (a_4=-1,124) and skewness (a_3=-714) coefficients that met the normality condition, the Shapiro-Wilk coefficient (w=.84, p=0,05) used in samples less than 50 did not meet the normality condition, and because the data were included in the ranking scale, the Mann-Whitney U test and Wilcoxon Signed Ranks test were applied at this stage. The effect size for the Z value was calculated with the formula $r=Z/\sqrt{N}$. In the interpretation of the effect size, Cohen stated that the r-value indicates a small effect at the level of .10, a medium effect at the level of .30, and a large effect at the level of .50 (Cohen, 1988; Field, 2009). The interpretation of the effect size is based on the intervals specified by Cohen.

(3) ***Data Analysis for the Observation Process for the Participants' Levels of Implementation of Safety Skills:*** Observation records were monitored by two observers, and the inter-observer reliability was found to be 100%. In the Observation Record Form, a total score was obtained by giving "1" point to each skill step performed by the participants, and the averages of these scores were compared with the experimental group post-test data.

(4) ***Data Analysis for the Interview Process Regarding SSIP:*** Interview data were analyzed by descriptive analysis and interpreted according to predetermined themes. The data were coded by two raters, and the inter-rater reliability was found to be 100%.

(5) ***Data Merging:*** In the last stage, the observation data and the interview data were merged to support the data obtained from the second stage, in which the experimental model was applied.

Findings

(1) Findings Obtained from the Development Process of SST

The analyses made to test the construct validity of the SST were carried out in five stages. These stages are as follows: (a) examination of difficulty and discrimination parameters of the items; (b) EFA; (c) examination of item difficulty and discrimination parameters for the items planned to be included in the final version of the form as a result of EFA; (d) CFA; and (e) reliability analysis.

(a) *Findings for item pool difficulty and discrimination analysis:* In the first stage of the data collection tool development process, difficulty and distinctiveness parameters were calculated for the 91 items that make up the item pool. First, the difficulty parameter, which shows the percentage of correct answers to the items, was calculated using the total number of correct answers (Cohen & Swerdlik, 2009; Baykul, 2015). Then, the discrimination parameters were determined by the point-biserial correlation method. The ranges given in Table 1 were taken as the basis for item difficulty and discrimination index interpretations.

Table 1. The ranges for item parameter interpretations (Ebel & Frisbie, 199; Şeker &0 Gençdoğan, 2006)

Item Difficulty Index		**Item Discrimination Index**	
0,20≥ pj ≥ 0,00	Very Difficult	rjx≤0,19	Low distinctiveness, not suitable
0,40≥ pj ≥ 0,21	Difficult	0,29≥rjx≥0,20	Insufficient distinctiveness, the item should be corrected
0,60≥ pj ≥ 0,41	Medium Difficulty	0,39≥rjx≥0,30	Good distinctiveness, suitable
0,80≥ pj ≥ 0,61	Easy	1,00≥rjx≥0,40	High distinctiveness, suitable
1,00≥ pj ≥ 0,80	Very Easy		

In the item difficulty analysis, 59 of the 91 items were at the level of "easy" 24 items were at the level of "medium difficulty" and 8 items were at the level of "very difficult". Item difficulty indexes range from 0.14 to 0.88. The easiest item is item 54; the most difficult item is item 45. The difficulty level of the 91-item item pool was determined to be 0.62. Although the difficulty distribution of the items in the item pool is not homogeneous, the average difficulty level of the whole test can be interpreted as "medium difficulty-easy". No item was removed from the test according to item difficulty levels.

As a result of the item discrimination index values, 77 items had high discrimination, 13 items had good discrimination, and one item was found to be insufficient. Item discrimination values vary between 0.29 and 0.62. Item 57 has the highest distinctiveness value, and item 44 has the lowest distinctiveness value. The discrimination index value of item 44, which has insufficient discrimination, was calculated as 0.29. This item has been revised.

(b) *Findings on the EFA process:* In the EFA process, which was carried out after examining the item parameters, the weighted least squares mean and variance adjusted (WLSMV) method was used as the estimation method since all of the items were in a categorical structure. In addition, polychoric correlations were used for EFA. It is recommended to use polychoric correlations and WLSMV, which is the most appropriate estimation method, in the analyses used for categorical variables (Barendse, Oort, & Timmerman, 2015; Muthén & Muthén, 2010).

In the examination of factor loading parameters, the factor loadings of items with factor loadings below 0.40 were interpreted as insufficient (Cokluk, Şekercioğlu, & Büyüköztürk, 2018). In addition, items that loaded more than 0.40 in more than one factor and that the difference between factor loads was below 0.10 were considered to have an overlapped loading. Items that did not load more than 0.40 in any factor or that had overlapped loading were removed.

Root Mean Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) fit indices were examined to evaluate model data fit in both EFA and CFA processes. In the literature review, it has been observed that researchers tend to prefer the cut-off criteria used for other data types in cases where categorical variables are estimated with the WLSMV method (Xia & Yang, 2018). RMSEA <.06, CFI> .95 and TLI> .95 cut-off criteria for a good model-data fit are widely discussed (Hu and Bentler, 1999). In addition, there are also sources revealing that the .05 - .08 range for RMSEA and a criterion of > .90 for TLI

indicate a good, acceptable fit (Bentler & Bonet, 1980; Jöreskog & Sörbom, 1993). The analysis results were evaluated based on these cut-off criteria.

According to the eigenvalues of the factors, a total of 18 factors had eigenvalues greater than 1. However, it was decided that theoretically, the items couldn't fall under the 18 factors. The factor analysis was limited to 4 factors, and after the examination, the items with insufficient factor loading and overlapping were removed and the analyses were repeated. As a result of the factor analysis being repeated nine times, 44 of 91 items were decided to be removed. The factor loads of the remaining 47 items are shared in Table 2.

Table 2. Item factor loadings remaining in the item pool

	Factor Number					**Factor Number**			
Item Number	**1**	**2**	**3**	**4**	**Item Number**	**1**	**2**	**3**	**4**
I1	**0.445***	0.184*	0.190	-0.078	I39	-0.035	0.153	**0.683***	0.098
I2	**0.652***	0.027	0.055	0.001	I40	-0.042	-0.025	**0.871***	-0.069
I3	**0.475***	0.129	0.222*	0.022	I41	0.044	0.157*	**0.759***	0.107
I7	**0.482***	0.103	0.254*	0.033	I42	-0.024	0.009	**0.936***	0.015
I11	**0.457***	-0.048	0.139	-0.013	I48	0.344*	-0.104	**0.610***	-0.102
I16	**0.683***	-0.200*	0.141	-0.089	I49	0.291*	0.026	**0.559***	0.133
I21	**0.573***	0.036	0.236*	0.051	I50	0.212*	0.016	**0.623***	-0.156*
I24	**0.696***	-0.157	-0.086	-0.039	I51	0.388*	-0.024	**0.634***	-0.032
I26	**0.613***	0.019	0.085	0.128	I52	0.063	0.102	**0.861***	0.019
I53	**0.859***	-0.229*	-0.017	0.111	I74	0.119	-0.017	**0.635***	0.058
I54	**0.869***	-0.236	0.033	0.076	I75	0.092	-0.305*	**0.581***	0.352*
I55	**0.867***	-0.201	0.045	0.171*	I76	0.059	-0.124	**0.781***	0.248*
I56	**0.801***	-0.126	0.135	0.086	I72	0.110	0.045	0.004	**0.729***
I57	**0.885***	-0.214	0.055	0.145	I78	-0.290*	0.000	0.263*	**1.000***
I58	**0.673***	0.175	0.142	-0.053	I79	-0.268*	0.036	0.247*	**1.012***
I59	**0.760***	0.150	0.216*	-0.123	I82	0.006	-0.014	-0.074	**0.970***
I60	**0.524***	0.109	0.095	0.114	I85	0.123*	-0.026	-0.098	**0.930***
I61	**0.568***	0.134	0.160	0.069	I88	0.073	-0.091	0.008	**0.915***
I62	**0.812***	0.255*	-0.044	0.081	I90	0.029	0.021	-0.003	**0.949***
I63	**0.901***	0.192	-0.053	-0.141	I91	0.075	0.106	-0.042	**0.952***
I64	**0.987***	0.181	-0.192	-0.030	**Factor Number**	**Eigenvalue**			
I33	0.379*	**0.627***	-0.164	0.057	1	21,056			
I34	-0.017	**0.917***	0.296*	-0.021	2	5,349			
I35	-0.025	**0.915***	0.356*	-0.018	3	4,378			
I36	0.129	**0.720***	0.035	0.045	4	2,665			
I37	0.110	**0.869***	0.085	0.047					
I38	0.358*	**0.866***	-0.023	0.023					

*p<0,05

As seen in Table 2, the item factor loads vary between 0.445 and 1.012. Item 79 has the highest factor load value, and item 1 has the lowest factor load value. The item factor load being over 1.00 does not indicate an error. Jöreskog (1999) stated that the item factor loads under the factors with a correlation between them may be above 1 due to the regression coefficient feature. Correlations in the range of 0.086 – 0.598 were observed between the four factors. A significant positive correlation was found between the 1st factor and the 3rd and 4th factors at the levels of 0.598 and 0.433, respectively ($p<0.05$). In addition, a significant correlation at the level of 0.271 was found between the 3rd and 4th factors ($p<0.05$). Other binary correlations between factors are statistically insignificant.

The eigenvalues for the four factors are 21,056-5.349-4.378-2.665, respectively. According to the fit indices showing the structure and data fit, the model data fit is at a good level. The RMSEA fit index is 0.040, the CFI fit index is 0.971, and the TLI fit index is 0.965.

(c) Findings for the final form item pool difficulty and discrimination analysis: Item discrimination and difficulty indexes were recalculated based on the new data collected for the remaining 47 items after EFA and are presented in Table 3.

Table 3. Final form of item pool difficulty and discrimination parameters

Item	pjx	Remark	rjx	Remark	Item	pjx	Remark	rjx	Remark
1.	0,59	Medium	0,42	High Discrimination	25.	0,26	Hard	0,32	High Discrimination
2.	0,73	Easy	0,50	High Discrimination	26.	0,22	Hard	0,34	High Discrimination
3.	0,48	Medium	0,42	High Discrimination	27.	0,25	Hard	0,42	High Discrimination
4.	0,42	Mediım	0,42	High Discrimination	28.	0,77	Easy	0,35	High Discrimination
5.	0,72	Easy	0,35	High Discrimination	29.	0,79	Easy	0,43	High Discrimination
6.	0,73	Easy	0,47	High Discrimination	30.	0,84	Easy	0,46	High Discrimination
7.	0,60	Medium	0,52	High Discrimination	31.	0,74	Easy	0,47	High Discrimination
8.	0,76	Easy	0,42	High Discrimination	32.	0,86	Easy	0,38	High Discrimination
9.	0,55	Medium	0,46	High Discrimination	33.	0,73	Easy	0,49	High Discrimination
10.	0,95	Easy	0,18	Should Be Removed	34.	0,52	Medium	0,49	High Discrimination
11.	0,96	Easy	0,23	Should Be Corrected	35.	0,90	Easy	0,49	High Discrimination
12.	0,96	Easy	0,23	Should Be Corrected	36.	0,73	Easy	0,49	High Discrimination
13.	0,95	Easy	0,24	Should Be Corrected	37.	0,65	Easy	0,40	High Discrimination
14.	0,94	Easy	0,34	High Discrimination	38.	0,74	Easy	0,38	High Discrimination
15.	0,86	Easy	0,30	Good Discrimination	39.	0,69	Easy	0,47	High Discrimination
16.	0,88	Easy	0,36	High Discrimination	40.	0,67	Easy	0,24	Should Be Corrected
17.	0,96	Easy	0,03	Should Be Removed	41.	0,65	Easy	0,36	High Discrimination
18.	0,94	Easy	0,26	Should Be Corrected	42.	0,61	Easy	0,36	High Discrimination
19.	0,81	Easy	0,34	High Discrimination	43.	0,59	Medium	0,36	High Discrimination
20.	0,80	Easy	0,39	High Discrimination	44.	0,69	Easy	0,31	High Discrimination
21.	0,83	Easy	0,38	High Discrimination	45.	0,76	Easy	0,37	High Discrimination
22.	0,39	Medium	0,46	High Discrimination	46.	0,71	Easy	0,27	Should Be Corrected
23.	0,26	Hard	0,40	High Discrimination	47.	0,68	Easy	0,24	Should Be Corrected
24.	0,28	Hard	0,40	High Discrimination					

According to the item difficulty index values presented in Table 3, 34 of the 47 items are easy, 8 are medium, and 5 are hard. Item difficulty index values vary between 0.22 and 0.96. The most difficult one is item 26; the easiest ones are items 11, 12, and 17. The mean of the total item difficulty index of the test is 0.69. It was deduced that the difficulty levels of the items in the final form item pool were predominantly easy, and the difficulty level of the whole test was also at the easy level.

The discrimination index values of the items vary in the range of 0.03–0.52. The discrimination indexes of items 10 and 17 are 0.18 and 0.03, respectively. Since the discrimination indexes of these two items were low, they were excluded from the final form. In addition, in line with the information that items 11, 12, 13, 18, 40, 46, and 47 needed to be corrected, amendments were made to these articles, and 45 articles remained for the final form. The mean difficulty index of 45 items was calculated at 0.68. According to this result, the removed items have not caused a serious change in the average difficulty of the test.

As a result of the construct validity examination with EFA, the measurement tool has a 4-factor structure. The factors were named Accidents, First Aid, Emergency Numbers, and Personal Safety, respectively. Safety skills related to emergency numbers refer to the ability to notify the emergency call center of situations that require serious assistance for individuals in other skill areas. Considering that it has a complementary function to all other safety skill areas in this respect, it has been evaluated that it is appropriate for the conceptual structure to include the safety skills related to emergency numbers at the end of the measurement tool. In this direction, the places of the 3rd and 4th factors were changed while generating the final form. After examining the item parameters, CFA was applied for the 4-factor, 45-item structure.

(d) *Findings Regarding the Confirmatory Factor Analysis Process:* In the confirmatory factor analysis process, as in the EFA process, the WLSMV estimation method is recommended for data sets with categorical variables (Muthén & Muthén, 2010; Barendse, Oort, & Timmerman, 2015). To check whether the structure is confirmed or not, four different fit indices, such as Chi-Square/sd, RMSEA, CFI, and TLI, were examined. Hu and Bentler (1999) defined threshold values for these fit indices to be able to determine a good fit. Accordingly, when Chi-square/sd<2; RMSEA<0.06; and when CFI and TLI >0.95, it can be interpreted that the model data fit is good. In addition, it can be reported that the model data fit is at an acceptable level for CFI and TLI values greater than 0.90. The results regarding the item parameters obtained as a result of the CFA analysis are presented in Table 4.

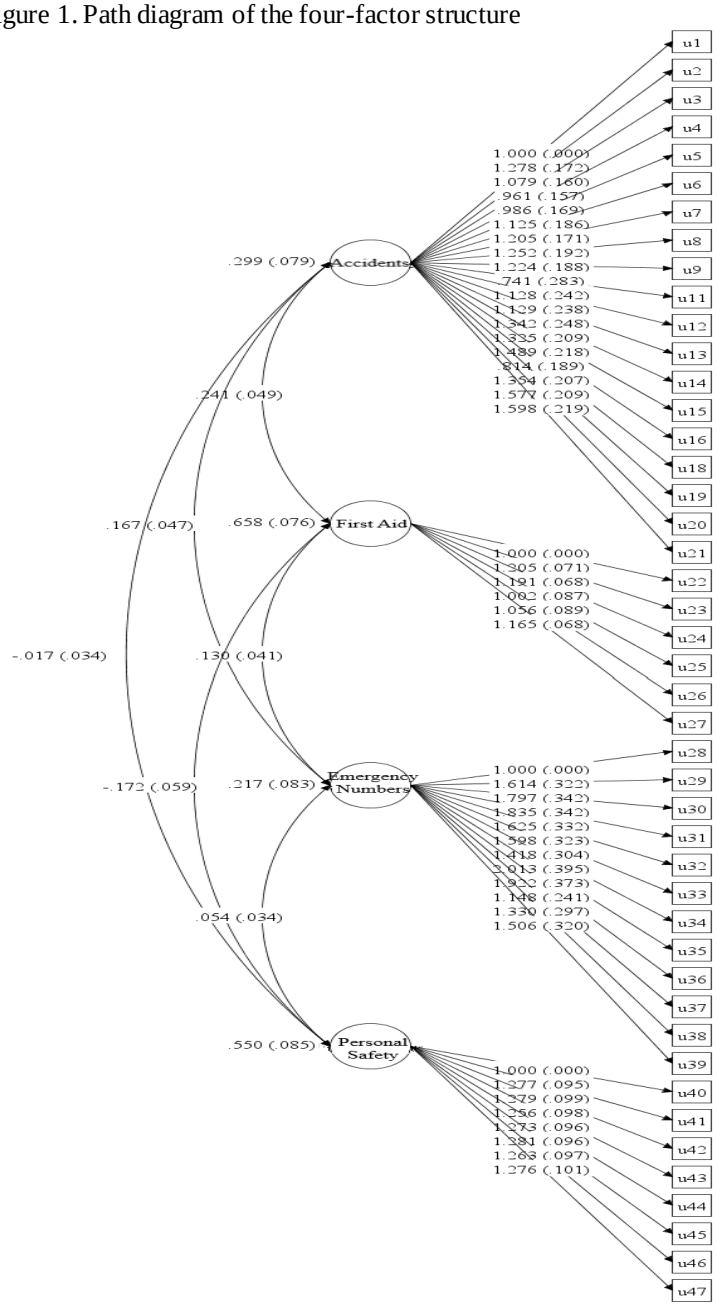
Table 4. Results on confirmatory factor analysis item parameters

Dimension	Item Number	Factor Load	Standard Error	R^2	T	T value significance level
Accidents	U1	0,547	0,072	0,299	7,613	0,000
	U2	0,699	0,064	0,489	10,869	0,000
	U3	0,590	0,067	0,348	8,793	0,000
	U4	0,526	0,067	0,277	7,792	0,000
	U5	0,539	0,074	0,291	7,290	0,000
	U6	0,615	0,075	0,378	8,186	0,000
	U7	0,659	0,062	0,434	10,612	0,000
	U8	0,685	0,066	0,469	10,330	0,000
	U9	0,670	0,058	0,449	11,593	0,000
	U11	0,405	0,153	0,164	2,650	0,008
	U12	0,617	0,085	0,381	7,271	0,000
	U13	0,617	0,103	0,381	6,000	0,000
	U14	0,734	0,082	0,539	8,920	0,000
	U15	0,725	0,056	0,526	12,969	0,000
	U16	0,814	0,051	0,663	15,850	0,000
	U18	0,445	0,086	0,198	5,178	0,000
	U19	0,741	0,057	0,549	12,894	0,000
	U20	0,862	0,035	0,743	24,300	0,000
	U21	0,874	0,039	0,764	22,132	0,000
First Aid	U22	0,811	0,047	0,658	17,258	0,000
	U23	0,978	0,017	0,956	56,022	0,000
	U24	0,966	0,016	0,933	60,043	0,000
	U25	0,813	0,061	0,661	13,327	0,000
	U26	0,857	0,053	0,734	16,203	0,000
	U27	0,945	0,03	0,893	31,978	0,000
Emergency Numbers	U28	0,466	0,089	0,217	5,249	0,000
	U29	0,751	0,054	0,564	13,868	0,000
	U30	0,837	0,048	0,701	17,438	0,000
	U31	0,855	0,036	0,731	23,423	0,000
	U32	0,757	0,057	0,573	13,369	0,000
	U33	0,744	0,071	0,554	10,449	0,000
	U34	0,660	0,064	0,436	10,376	0,000
	U35	0,938	0,038	0,880	24,539	0,000
	U36	0,895	0,031	0,801	28,795	0,000
	U37	0,535	0,075	0,286	7,089	0,000
	U38	0,620	0,073	0,384	8,462	0,000
	U39	0,702	0,062	0,493	11,234	0,000
Personal Safety	U40	0,742	0,057	0,551	12,975	0,000
	U41	0,947	0,021	0,897	45,572	0,000
	U42	0,949	0,019	0,901	50,089	0,000
	U43	0,932	0,022	0,869	42,205	0,000
	U44	0,944	0,022	0,891	43,451	0,000
	U45	0,950	0,023	0,903	40,900	0,000
	U46	0,937	0,025	0,878	38,022	0,000
	U47	0,947	0,021	0,897	45,677	0,000

According to Table 4, the factor loads of items vary between 0.405 and 0.978. Item 11 has the lowest factor load, and Item 23 has the highest factor load. Considering item factor loads and R^2 values, variance explanation rates of items, which are observed variables, on factors that are latent variable structures are between %16,4 and %95,6. According to the examination of observed and latent variables, the items that make up the structure are sufficient. The T values of the items vary between 2.65 and 60.043. Considering that the critical T value is 1.96 at the 95% confidence level (sd = ∞), the T values of all items are significant. The fact that all item T values are significant at the 95% level indicates that the items can be significantly predicted by latent variables. When all these statistical parameters are evaluated theoretically in the context of the relationships between the item and

latent variables, it can be argued that the structure is statistically appropriate. The path diagram of the model obtained as a result of DFA is shown in Figure 1.

Figure 1. Path diagram of the four-factor structure



The fit indices calculated for the four-factor model as a result of confirmatory factor analysis are as follows: Chi-Square /sd=1,545; RMSEA=0,052 (0,045 – 0,057); CFI = 0,921 ve TLI = 0,917. These results indicate that the four-dimensional structure is acceptable and fits well.

(e) *Findings Regarding the Reliability Analysis Process:* The KR-20 coefficient for this test, which was scored as 1-0, was .898; Cronbach Alpha coefficients for sub-dimensions were 0.794 for "accidents" 0.875 for "first aid" 0.794 for "emergency numbers" and 0.921 for "personal safety". These values indicate that the sub-dimensions in the test have sufficient reliability (α>0.70). Accordingly, it can be interpreted that the measurement tool is reliable for the sample.

(2) Findings Obtained During the Implementation Process of SSIP

Table 4. U-test result of SSIP's experimental and control groups' pretest data

Grup	N	Mean Rank	Sum of Ranks	U	P
Experimental	16	15,84	253,50	117,5	,691
Control	16	17,16	274,50		

According to Table 4, there was no significant difference between the safety skill levels of the students in the experimental and control groups before the instruction (U=117.5, p>0.05). Accordingly, it can be said that the experimental and control groups are equivalent.

Table 5. U-test result of SSIP's experimental and control groups posttest data

Grup	N	Mean Rank	Sum of Ranks	U	P
Experimental	16	24,31	389	3	,000
Control	16	8,69	139		

According to Table 5, there is a significant difference between the level of safety skills of students with mild ID who participated and those who did not participate in SSIP (U=3, p<0.01). According to their mean rank, students with mild ID who attended SSIP had higher levels of security skills than those who did not participate in the instruction. This finding indicates that SSIP is effective in increasing the level of safety skills of students with mild ID. The effect size for the z value is found to be r=-0.83 for z=-4.725. The fact that the effect level is above .5 indicates that the implementation has a large effect.

Table 6. The signed ranks test result of SSIP scores

Posttest-Pretest	N	Mean Rank	Rank Sum	z	P
Negative Rank	0	,00	,00	3,52*	,000
Pozitive Rank	16	8,50	136		
Equal	0				

According to Table 6, Wilcoxon signed-rank test results indicate that there is a significant difference between the pre-test and post-test scores of the students who participated in the instruction (z=3.52, p<.05). Considering the mean rank and sums of the difference scores, the difference is in favor of the posttest score. Accordingly, SSIP has a significant effect on improving students' safety skills.

(3) Findings Obtained in the Process of Observing the Levels of Implementation of Safety Skills of Individuals with Mild Intellectual Disabilities

The difference between the experimental group post-test scores ($\bar{x}_{experiment\text{-}posttest}$=41.18) and the averages of the observation data ($\bar{x}_{experiment\text{-}observation}$=34.81) [($\bar{x}_{experiment\text{-}posttest}$= 41,18)-($\bar{x}_{experiment\text{-}observation}$= 34,81)= 6.37] according to the highest score that can be obtained from the measurement tool (45) is 14.15%. Hereunder, the level of preservation of the safety skills acquired by the students during the observation process was found to be 14.15% lower than the highest possible score. In other words, according to the observation data collected in the week following the instruction, the safety skills acquired by the students were preserved at a level of 85.85%.

(4) Findings Obtained in the Interview Process Regarding SSIP

In the focus group interviews, the first question to the students was, *"Which of the safety skills have you learned as a result of this study?"* 15 students stated that they had learned the traffic lights; nearly half of them (f=7) stated that they had learned to wear a helmet while on a bicycle; 3 of them stated that they had learned how to make way for others, and two students stated that they had learned the direction of the road and riding on the bicycle path. Regarding this, a student said, *"We have learned to ride a bicycle on the bicycle path. I learned about traffic lights. We get ready in yellow. We go to the green. We stop at red."* (12th student).

9 students stated that they had learned to hold the knife properly; 8 students stated that they had learned to walk carefully on the wet floor; 7 students stated that they had learned to close the open detergent bottle; 6 students stated that they had learned to carefully collect the broken items; and 5 students stated that they had learned to touch the hot oven with a glove. Regarding this, a student said, *"We will put the knife in its place. We will close the lid on the detergent. We will walk slowly"* (10th student).

Almost half of the students (f=7) stated that they had learned to say no to the risks coming from the social environment and to stay away from them, while most (f=9) stated that they had learned to tell the risks coming from the social environment to an elder they trust. Half of the students (f=8) stated that they had learned to report the risks coming from the virtual environment to a trusted adult and to prevent risky messages. Regarding this, a student said, *"We're just looking through the peephole. About that, well, we have to shout. We have to stay away from it. We have to go,"* the 12th student said.

Twelve students stated that they had learned how to call 112 emergency numbers, and six of them stated that they had learned how to ask for help over the phone. Regarding this, a student said, *"..getting help; 112"* (1st student).

Secondly, the question *"What do you think learning about safety skills has contributed to you?"* has been asked of the students. Nearly half of the students (f=6) stated that the SSIP contributed to their learning to protect themselves. Five students stated that it helped them have fun. A student stated that it helped to feel confident in traffic, and a student stated that the study had served as a model for them. Regarding this, a student said, *"We have learned to protect ourselves."* (6th student).

Thirdly, the question *"How important are the safety skills taught in this study to you?" has been asked of the students*. The majority of the students (f=10) stated that the safety skills taught were important to them.

In individual interviews, firstly, the question *"Which safety skills did your child learn as a result of this study?"* has been asked to the parents. The majority of the parents (f=14) stated that their children had learned about the traffic lights. Two parents stated that they had learned many things about traffic rules and how to walk properly on the sidewalk. A parent said that his child had learned to walk across the street, and a parent stated that his child had learned to wear a helmet while riding a bicycle. Two parents stated that their child had learned home accident prevention skills. A parent stated that her child learned self-help first aid skills. The majority of the parents stated that their children had learned to protect themselves against the risks of the social environment (f=14) and the virtual environment (f=13). The majority of the parents (f=10) stated that their children had learned to call the emergency number, and three of them stated that their children could consider heading for the fire escape in case of an emergency. Regarding this, a mother said, *"They have learned about lights. They have learned how to walk across the street. So they have learned pretty much what is necessary."* (5th parent) said. Regarding personal safety skills, a parent said, *"He learned it too. We also warn him."* (1st parent).

Secondly, the question *"How do you think learning safety skills has contributed to your child?" has been asked of the parents. While 8 parents stated that teaching safety skills to their children contributed to their development in terms of development, 3 parents stated that it contributed to their children's self-confidence, one parent stated that there had been a decrease in problem behaviors, and one parent stated that there had been an improvement in social skills. Regarding this, a mother said, "Of course, it helps. They have a lot of benefits for society. Actually, Berna was more fearful before. She's more daring now. She couldn't even stay at home in case a stranger came home. She was even afraid of it. So after training, it's better this year. She can stay more peaceful."* (4th parent).

Thirdly, the question *"How important are the safety skills taught in this study to you?"* has been asked to the parents. All of the parents (f=10) stated that the safety skills taught were very important to them. Regarding this, one mother said, *"It is very important to me. Very important. "This kind of kid usually can't defend themselves much because they can't express themselves."* (3rd parent) and a father: *"They are all important to me. Because everything you teach matters. By God, I think it is a very useful thing, something useful."* (8th parent) said.

(5) Combination of Data

As a result of the validity and reliability analysis, the SST, which consists of 21 scenarios and 45 items, has a 4-factor structure and is a valid and reliable tool in assessing the knowledge levels of individuals with mild ID aged 6–19 years in the dimensions of accidents, first aid, personal safety, and safety skills related to emergency numbers.

The SSIP, which covers the safety skill areas evaluated by SST, is broadly effective in teaching safety skills related to accidents, first aid, personal safety, and emergency numbers to individuals with mild ID and aged 7–16 (14 males and 18 females).

Observation results indicate that the acquisitions obtained with SSIP were maintained at 85.85% after one week. Also, the acquisitions belonging to each factor of the measurement tool were largely preserved.

Accordingly, the factor analysis, validity, and reliability results of the measurement tool, the effective results, and observation data obtained from the application of the SSIP, which includes the scenarios in the measurement tool, support each other, and the construct validity of the four-factor structure has been ensured.

According to the results obtained from the interviews, the participants concluded that the acquisition of safety skills related to accidents, first aid, personal safety, and emergency numbers had been achieved to a large extent, and the teaching of these skills had contributed to the development of the students and had been important for them.
In this study, students' safety skills related to accidents, first aid, personal safety, and emergency numbers were evaluated using both quantitative and qualitative data. Qualitative data were collected by observation and interview, while quantitative data were collected with SST. First of all, the level of safety skills of the students was evaluated quantitatively with the measurement tool. Then, with the observational assessment made after the instruction, the students' display of their safety skills in the simulation setting was evaluated. Finally, student and parent views on safety skills were evaluated qualitatively. The results obtained with these three different data types support each other and contribute to the construct validity of the measurement tool. Thus, the effectiveness of SSIP has been extensively examined.

Discussion

This research aims to develop a valid and reliable measurement tool for assessing the safety skills of individuals with mild ID regarding accidents, first aid, personal safety, and emergency numbers; to examine the effectiveness of SSIP in teaching safety skills to these individuals; and to determine the views of students and parents on the instruction of safety skills. In line with this purpose, in the first stage of the research, it was found that the SST has a four-factor structure and is a valid and reliable tool for evaluating the safety skills of individuals with mild ID regarding accidents, first aid, personal safety, and emergency numbers. Personal safety skills (Tutty, 1995; Wurtele et al., 1986; Wurtele et al., 1998) and home accident prevention skills (Letts et al., 1998; McNulty & Fisher, 2001) were addressed in the literature in the development of measurement tools that assess safety skills.

The Children's Knowledge of Abuse Questionnaire (CKAQ), developed by Tutty (1995), consists of both true-false and Likert-type items and has a two-factor structure that evaluates children's beliefs, knowledge, and skills about abuse. Only reliability analyses were applied to the Personal Safety Questionnaire (PSQ) (Wurtele et al., 1986) and the What If Situations Test (WIST) (Wurtele et al., 1998), which measure personal safety skills.

The psychometric properties of SAFER, which evaluates home accident prevention skills observationally, were determined by inter-rater reliability, test-retest reliability, and construct validity (Letts et al., 1998). Predictive validity analysis was performed by comparing the Assessment of Motor and Process Skills (AMPS) with SAFER (McNulty & Fisher, 2001).

The Children's Knowledge of Abuse Questionnaire (CKAQ) (Tutty, 1995), Personal Safety Questionnaire (PSQ), and What If Situations Test (WIST) (Wurtele et al., 1998) have been applied to typically developing children and only address personal safety skills. SAFER and the Assessment of Motor and Process Skills (AMPS), which evaluate home accident prevention skills, have been prepared in a checklist format and observationally evaluate the home accident prevention skills of individuals with psychiatric disorders accompanied by cognitive disabilities. The validity and reliability study of the SST, which has been developed within the scope of this research, was conducted on individuals with mild ID and includes personal safety skills as well as safety skills related to accident prevention, first aid, and emergency numbers.

SST is a scenario-based achievement test designed to evaluate the knowledge level of individuals with mild IDs between the ages of 6 and 19 regarding accidents, first aid, personal safety, and emergency numbers. In this respect, SST is similar to CKAQ (Tutty, 1995), WIST, and PSQ (Wurtele et al., 1986; Wurtele et al., 1998). In this study, content validity, construct validity, and reliability studies were also carried out. The findings revealed that the measurement tool is valid and reliable in determining the safety skills of individuals with mild ID at the level of knowledge regarding accidents, first aid, personal safety, and emergency numbers.

In the second stage of the research, the effectiveness of SSIP was examined, and the instruction has been effective in teaching safety skills related to accidents, first aid, personal safety, and emergency numbers to individuals with mild IDs. In the literature, the scope of instructions for teaching safety skills includes protection skills for the risks from the physical environment and the social environment (Gast et al., 1992). Within the

scope of protection skills from the risks of the physical environment, pedestrian and traffic safety (Batu et al., 2004; Branham et al., 1999; Coles et al., 2007; Matson, 1980a; Page et al., 1976), first aid and emergency numbers (Christensen et al., 1996; Marchand-Martella & Martella, 1990; Matson, 1980b; O'Reilly & Cuvo, 1989; Spooner et al., 1989; Self, Scudder, Weheba & Crumrine, 2007), fire safety (Matson, 1980a; Mechling, 2008), and safety skills for the prevention of home accidents (Self et al., 2007) were taught. On the other hand, the skills to avoid risks from the social environment include the skills to avoid the traps of strangers (Collins et al., 1999; Gast et al., 1993; Mechling, 2008; Watson, Bain, & Houghton, 1992). On the other hand, the intense digitalization trend poses a risk for all children and young people, as well as those with special needs, in terms of the traps of strangers in the virtual environment. And it takes place in the literature, albeit a little (Didden et al., 2009). (Didden et al., 2009). The SSIP applied in this research has been prepared as a holistic program to cover the skills of protection from the risks coming from the physical, social, and virtual environments, which are handled separately in the literature.

While the skills for protection against risks from the physical environment are handled in the sub-dimensions of Accidents, First Aid, and Emergency Numbers; the risks from the social and virtual environments are handled together in the Personal Safety sub-dimension. In this respect, it is a more comprehensive teaching process than other applications in which safety skills are taught.

In research in which safety skills are taught, BST (Bevill & Gast, 1998; Mechling, 2008; Wurtele et al., 1998), game-based teaching (Cavett, 2017; Coles et al., 2007; Fox et al., 1984), small group instruction (Fox et al., 1984; Gast et al., 1992), social stories (Kutlu & Kurt, 2017; Kutlu, 2016; Özdemir, 2007; Süzer, 2015), applied behavior analysis (O'Reilly & Cuvo, 1989), errorless teaching methods (Batu et al., 2004; Collins et al., 1992; Gast et al., 1992; Gast et al., 1992; Gast et al., 1992; Gast et al., 1993), direct teaching method (Christensen et al., 1996), and video modeling (Branham et al., 1999; Ergenekon, 2012) are used separately or together. BST is generally applied in six stages in the literature (Bevill & Gast, 1998; Mechling, 2008): (a) specifying target behaviors; (b) preparing instructions; (c) explaining the target skill to the participant; (d) rehearsing and modeling; (e) role-playing and giving feedback; (f) independent practice. The instruction program used in this study consists of three stages: (a) explaining the target skill to the participant; (b) rehearsal, role-playing, and giving feedback; and (c) independent practice. In addition, in this study, a board game was included as an enhancement activity along with BST. SSIP is effective in teaching safety skills related to accidents, first aid, personal safety, and emergency numbers to individuals with mild IDs.

According to the observation data collected one week after the application of SSIP in the third stage of the study, the level of preservation of the safety skills acquired by the students was found to be 85.85%. The acquisition for each factor is largely preserved. Accordingly, the factor analysis, validity, and reliability results of the measurement tool, which was determined to have a four-factor structure, the effectiveness results obtained from the application of the SSIP covering the scenarios in the SST, and the observation data supported each other, and the construct validity of the four-factor structure was ensured.

Studies in the literature on teaching safety skills are generally single-subject studies, and follow-up data have been collected to determine the level of preservation of the acquired knowledge over time. In the follow-up sessions of research on teaching safety skills, the acquisition was fully or partially preserved (O'Reilly, Green, & Braunling-McMorrow, 1990; Öncü, 2019; Christensen, Lignugaris-Kraft, & Fiechtl, 1996; Gast et al., 1992; Marchand-Martella & Martella, 1990; O'Reilly and Cuvo, 1989; Gast et al., 1993; Kutlu, 2016; Watson et al., 1992; Özen, 2008). In this research, the knowledge that students learned in the context of theory and practice was practiced once again during the observation, and it was checked whether the acquisition was preserved or not. According to the observation data, the acquisition was partially preserved.

According to Cronbach and Meehl (1955), an acceptable psychological construct should be associated with behavior. Observation of the individual's performance process can be decisive in explaining the validity of a test when used in conjunction with factor analysis, which is used to examine whether a measurement tool measures the assumed "general learning ability". In this study, first, the scenarios related to the safety skills in the SST were explained, and the participant's level of knowledge was evaluated before and after the instruction. After the instruction, the level of application of the knowledge in the simulation setting was evaluated by observation in line with the same scenarios. Thus, the construct validity of the measurement tool was handled in a multidimensional way and was supported by observational process data in addition to factor analysis.

According to the results obtained from the student and parent interviews, the participants concluded that the acquisition of safety skills related to accidents, first aid, personal safety, and emergency numbers had been achieved to a large extent; these skills had contributed to the students' development and had been important os how . Studies reveal that parents are satisfied with teaching safety skills to their children (Gast et al., 1992; Özen, 2008). The students and parents participating in this research are also satisfied with the instruction program and conclude that the skills have been acquired to a large extent.

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Recommendations

The use of the SST to assess the safety skills of students with intellectual disabilities in schools is recommended. It is recommended that SSIP be integrated into the education programs of individuals with intellectual disabilities and implemented in schools. It is recommended to include the instruction of safety skills in inclusive settings. The psychometric properties of the SST can be studied by comparing it with typically developing students. Research on teaching security skills can be carried out with different teaching methods.

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Author (s) Contribution Rate

The authors contributed equally to the design and implementation of the research, to the analysis of the results, and to the writing of the manuscript.

Conflicts of Interest

The authors have no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

Ethical Approval

Ethical permission (13/12/2018-2018/265) was obtained from the Bolu Abant Izzet Baysal University Human Research Ethics Committee in Social Sciences for this research.

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Behavioral Self-Regulation Skills and the Teacher-Child Relationship in Early Childhood

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Behavioral self-regulation skills and the teacher-child relationship in early childhood

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Abstract

The present study examined the relationship between children's behavioral self-regulation (BSR) skills and the teacher-child relationship (TCR). Furthermore, this study investigated the contribution of TCR, child age, family monthly income, and child gender on children's BSR assessed by the Revised Head-Toes-Knees-Shoulders. Participants consisted of 292 children aged 42 to 77 months. The data were analyzed using Pearson product-moment correlation and multiple linear regression analysis. The results showed a moderately positive relationship between BSR skills and TCR's closeness subscale and a moderately negative relationship between BSR skills and TCR's conflict subscale. Except for child gender, the TCR's subscales, child's age, and family monthly income significantly predicted the total score of BSR skills. TCR closeness was the strongest predictor of BSR skills, followed by TCR conflict, child age, and family monthly income. The results suggest that teacher-child relationships are essential for children's BSR skills.

Keywords: Behavioral self-regulation, Early childhood, Teacher-child relationship, Closeness, Conflict.

Introduction

Children who start kindergarten face increasing demands for behaviors appropriate to the educational environment. Children are expected to listen, remember, follow directions, share, wait their turn, and behave according to classroom rules (Phillips et al., 2017). These skills, which require self-regulation (SR), develop rapidly when children attend kindergarten (Montroy et al., 2016). Studies indicate that children are born with the potential to develop SR skills (Center on the Developing Child at Harvard University [CDC], 2014; Savina, 2021). Therefore, high-quality early childhood education influences children's SR skills, and teacher-child interaction is a critical component of quality early childhood education. The sensitive and responsive interaction between the teacher and the child motivates children to learn, deepens their learning, and improves their SR skills (Phillips et al., 2017). From this point of view, this study aims to examine the relationship between children's behavioral self-regulation (BSR) skills and the teacher-child relationship (TCR).

Behavioral Self-Regulation in Early Childhood

SR is a complex structure with cognitive, emotional, and behavioral dimensions (Kim & Kochanska, 2012; McClelland et al., 2015; McClelland & Cameron, 2012). The cognitive dimension of SR, also called executive functions, consists of three components that enable individuals to exhibit their SR skills behaviorally: working memory (WM), inhibitory control (IC), and cognitive flexibility (CF) (McClelland et al., 2007; Morrison et al., 2010). WM is related to children's keeping the instructions in mind, remembering them, and following them (Gathercole & Pickering, 2000). IC enables children to inhibit their strong internal tendencies or impulsive reactions and produce more appropriate responses (Diamond, 2013). Finally, CF enables children to shift and maintain their attention between different tasks consciously, even if there is a distraction in the environment (Blair & Diamond, 2008; Blair & Ursache, 2011; Rothbart & Posner, 2005). Studies indicate that SR has an integrated structure and that the components of WM, IC, and CF work in an integrated manner (McClelland et al., 2007; Tominey & McClelland, 2013; Wiebe et al., 2008; Willoughby et al., 2012). BSR is defined as the manifestation of these components in the child's real-life behaviors (McClelland et al., 2014; Ponitz et al.,

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2009). Consistent with this view, the current study considers the integrated nature and behavioral dimension of SR.

Early childhood is a critical period for the development of BSR skills. In addition to the child's genetic characteristics, environmental experiences considerably affect the development of BSR (Berger, 2007; Posner et al., 2014). The socio-economic status of the family, parenting behaviors, and the TCR in the classroom environment influence children's BSR skills (Kochanska et al., 2000; Li et al., 2017; Liew et al., 2010; Rodriguez et al., 2005; Williams & Berthelsen, 2017). From infancy, meaningful social interactions shape children's SR skills (Bronson, 2000; CDC, 2014). When children start school, their social environment expands. Thus, in addition to the family, external resources such as teachers and peers are included in this environment (Kopp, 1982; Pauen, 2016). In addition to internal resources such as genetics and temperament, external resources such as teachers, peers, and the school environment guide children's behaviors in the school environment (Hamre & Pianta, 2001; Usher & Schunk, 2017; Wang et al., 2016). Studies show that TCR and SR skills are related (Acar et al., 2019; Acar et al., 2018; Liew et al., 2010; Phillips et al., 2022). As a result of their study with disadvantaged children, Acar et al. (2021) revealed that a close TCR is positively related to children's SR skills, and a conflicted TCR is negatively related to children's SR skills.

The bio-ecological model (Bronfenbrenner & Morris, 2006) that explains environmental factors in a child's development may offer a perspective to understand the links between SR skills and TCR. According to this, a child's development is affected by experiences in a series of intertwined systems that interact. These systems expand from the microsystem (proximal context), which includes the child's experiences with his/her closest environment, such as his or her family, classroom, and teacher, to the macrosystem (distal context), the most expansive environment covering cultural values, laws, and policies. The microsystem includes the interactions with the immediate environment (family, teachers, and peers) that most strongly influence the child's development (Degol & Bachman, 2015).

Qualities of Teacher-Child Relationships and Children's Behavioral Self-Regulation

In the bio-ecological model, positive dynamics between the teacher and the child are an essential proximal context that facilitates learning and development. Teachers provide children with a safe and supportive learning environment and support children's participation in effective pedagogical practices, which affect children's learning processes (Elster, 2014). One of the most critical components of a supportive environment is a consistent and safe relationship between the teacher and the child (Pianta, 1999; Pianta et al., 1997).

In this current study, the TCR is conceptualized within the framework of two widely studied basic dimensions: closeness and conflict (Koomen et al., 2012; Pianta, 2001; Rudasill et al., 2010; Settanni et al., 2015). According to Birch and Ladd (1997), closeness, the positive dimension of the TCR, includes emotional warmth and open communication between the teacher and the child. The fact that the child is in a close relationship with his or her teacher increases his or her positive feelings and attitudes toward school, his or her participation in school, and his or her prosocial behavior (Birch & Ladd, 1997; Birch & Ladd, 1998; Hamre & Pianta, 2001). Conflict, the negative dimension of the TCR, means the lack of harmony and conflict between the teacher and the child. A conflicting TCR is a source of stress for children. Children can develop angry and anxious feelings due to the stress they experience. It may cause the child to develop negative feelings and attitudes toward school, become alienated from school, have problems adapting to school, and have behavioral problems. These sources of stress can also negatively affect a child's academic success (Birch & Ladd, 1997; Hamre & Pianta, 2001).

Previous studies have shown that the quality of teacher-child interaction plays an essential role in children's school readiness, school adjustment, social competence, and academic achievement (Birch & Ladd, 1997; Burchinal et al., 2008; Güleç & İvrendi, 2017; Hamre & Pianta, 2001; OECD, 2018; Vandenbroucke et al., 2018). A study stated that warm, sensitive, and supportive teacher-child interaction encourages children to use better SR skills (Hatfield et al., 2021). Birch and Ladd (1997) found a negative relationship between a conflicted TCR and liking school, SR, and collaborative participation and a positive relationship between a close TCR and liking school, SR, and academic achievement. Acar et al. (2021) revealed a relationship between low regulatory temperament and high SR when teacher-child conflict decreased. This finding indicates that related temperamental problems can be decreased by fostering close teacher-child relationships and encouraging SR in children.
BSR scores of children who experienced positive interaction with their teachers in the educational environment were found to be higher, regardless of family risk factors (mother and father education level, family

employment status, family income, number of people living in the home environment) (Cadima, Enrico, et al., 2016). Therefore, regardless of factors that strongly influence BSR, a child's close relationships with his or her teacher may have a decisive role in BSR skills.

Socio-Demographic Variables and Children's Behavioral Self-Regulation

Various child and family factors, such as child age, family income, and child gender, are associated with SR skills (Gestsdottir et al., 2014; İvrendi & Erol, 2018; Lawson et al., 2018; Matthews et al., 2009; Salminen et al., 2021). For example, studies indicate that the development of SR skills is related to age, and older children can self-regulate better than younger children (Ertürk-Kara & Gönen, 2015; Whitebread & Basilio, 2011). Some studies found that girls' SR skills are higher than boys' (Matthews et al., 2009; McClelland et al., 2007; İvrendi & Erol, 2018). However, other studies did not find gender differences (Ertürk-Kara & Gonen, 2015; Son et al., 2013; Yamamoto & Imai-Matsumura, 2017). Inconsistent findings regarding the relationship between gender and SR skills require re-examining the relationship between gender and SR skills. Additionally, recent studies show that family income significantly affects BSR skills (Cadima, Enrico, et al., 2016; Duncan et al., 2017; Evans & Rosenbaum, 2008; Tominey & McClelland, 2013). Cadima, Enrico et al. (2016) found that children from socio-economically disadvantaged backgrounds have lower levels of BSR than their peers. This study examines the relationships between the abovementioned variables (child age, family income, and gender) and BSR skills. The primary aim is to provide further evidence about the relationships between these variables and BSR skills. Another aim is to determine whether these variables and the TCR predict BSR skills.

Current Study

Numerous studies examining the TCR indicate that the perceived positive TCR is associated with children's social and academic outcomes (Buyse et al., 2008; Hughes & Kwok, 2006; Schmerse, 2020). The perceived negative TCR is a risk factor for the child's school adjustment, academic success, and behavior (Acar et al., 2021; Acar et al., 2022; Buyse et al., 2008). However, limited studies examined the relationship between the perceived TCR and BSR skills measured by the integrated structure of SR skills (Cadima, Verschueren et al., 2016; Hatfield et al., 2021). The present study examined children's BSR skills using the HTKS-R assessment tool, a psychometrically powerful and performance-based tool suitable for the integrated structure of BSR and teacher-child relationships based on teacher views. Possible relationships between socio-demographic variables (age, family monthly income, and gender), BSR skills, and TCR subscales were investigated. In this study, the answers to the following research questions were sought:

RQ1: What is the relationship between children's socio-demographic variables, BSR skills, and TCR subscales?
RQ2: Do independent variables (the TCR subscales, child age, gender, and family monthly income) predict children's BSR skills?

Method

This study used a relational survey method to examine the predictive power of children's socio-demographic variables and TCR subscales on their BSR skills (Chirstensen et al., 2015).

Participants

Participants for the part of examining the psychometric properties of HTKS-R consisted of 388 children aged 42 to 77 months, attending preschool and kindergarten in a southwestern province of Turkey in the fall semester of the 2021-2022 academic year. In this study, the convenience sampling method was used. Patton (2015) mentions that the easily accessible sampling method can minimize time, effort, and cost loss. In addition, an easily accessible sample provides speed and practicality to the research (Yıldırım & Şimşek, 2013). Of the participants, 196 (50.5%) were girls, and 192 (49.5%) were boys. The average age of children was 60 months. The youngest child participating in the study was 42 months old, and the oldest was 77 months old. Of the children, 306 (78.9%) attend preschool education for one year, 50 (12.9%) for two years, and 32 (8.1%) for three years. The average monthly income of families is 6653_{TL}. This income level is above the minimum living wage determined in Türkiye for 2021 (Minimum Wage Determination Commission Decision, 2020). Just as 196 (43.6%) of the mothers were college graduates, 136 (35.1%) of the fathers were college graduates. Missing values about the family monthly income and outliers were removed from the data to examine the relationship

between children's socio-demographic variables and TCR subscales on children's BSR skills. As a result of this procedure, data from 292 participants out of 388 were used in the regression analysis.

Data Collection Tools

Child Information Form

This form comprises items related to the child and family features, such as gender, age, and family income.

Self-Regulation Skills Scale (Teacher-Form)

Based on teachers' views, this scale assesses the SR skills of preschool children aged four to six (İvrendi & Erol, 2018). This scale consists of 22 items and three subscales: WM (e.g., remembers instructions given to perform a task or activity), IC (e.g., solves problems by talking to friends), and attention (e.g., obeys rules without reminding). The internal consistency coefficient (Cronbach's alpha) of the total score was .94. The Cronbach's alpha values for its subscales ranged from .91 to .87. Item-total correlation values ranged from .41 to .77. Also, the scale's fit indexes of the structure obtained from the CFA were at a sufficient level ($\chi 2/df=1.28$, RMSEA=.05, SRMR=.07) (İvrendi & Erol, 2018). For the current study, Cronbach's alpha values were .96 for the total score, .91 for IC, .94 for attention, and .95 for WM.

Student-Teacher Relationship Scale-Short Form (STRS-S)

Developed by Pianta (2001) and adapted into Turkish by Ası and Karabay (2017), the STRS-S was used to determine the teacher's perception of the relationship with a child. STRS-S consists of 15 items and two subscales: closeness (e.g., it is easy to understand and share what this child feels) and conflict (e.g., this child maintains anger or resistance after being disciplined). Its Cronbach's alpha values were .82 for the total score, .84 for the conflict subscale, and .76 for the closeness subscale. Test-retest reliability coefficients were.83 for the total score, .87 for the conflict subscale, and .83 for the closeness subscale. The CFA values of the STRS-S were that the $\chi 2$ value was 274.99 and df= 83, and the value obtained by dividing the $\chi 2$ value by the degrees of freedom remained at the level of NC=274.99/83= 3.3, and this ratio was accepted as a good fit level. Other goodness-of-fit statistics were found to be CFI value .97, GFI value .96, NFI value .96, and RMSEA .053 (Ası & Karabay, 2017). For the current study, Cronbach's alpha values of the STRS-S were .87 for the total score, .83 for the closeness subscale, and .88 for the conflict subscale.

Revised Head-Toes-Knees-Shoulders (HTKS-R)

The HTKS-R was adapted into Turkish to assess children's BSR skills in this present study. The HTKS-R was revised by McClelland et al. (2018) based on the previous Head-Toes-Knees-Shoulders (HTKS) BSR skills assessment tool (McClelland et al., 2014). As a direct measure of the BSR skills of children aged four to eight based on performance, the scale consists of 22 exercises and 37 testing items and includes the features of CF, WM, and IC components (Gonzales et al., 2021; McClelland et al., 2018). The scale is an updated version of the three-part HTKS (McClelland et al., 2014), including a new extension at the beginning. The newly added extension has Chapter 0 (Contrasts), four exercise items (e.g., what do you say when you say head?), and seven test items in which children are asked to say the opposite (e.g., if I say head, you?). The rest of the HTKS-R follows the same protocol as the original HTKS, which consists of three parts. The first part contains two different instructions, seven exercises, and ten test items. The child is asked to do the opposite of the given instruction (it is expected to touch your feet when it is said to touch your head and to touch your head when it is said to touch your feet). In the second part, there are four different instructions, and the child is expected to do the opposite of the given instruction (it is expected to touch your feet when it is said to touch your head, to touch your head when it is said to touch your feet. It is expected to touch your shoulders when it is said to touch your knees, and to touch your knees when it is said to touch your shoulders). In the third part, the rules change: when it is said to touch your head, he/she should touch his/her knees; when it is said to touch your knees, he/she should touch his/her head; when it is said to touch your shoulders, he/she should touch his/her feet; when it is said to touch your feet, he/she should touch his/her shoulders (Gonzales et al., 2021).

The HTKS-R consists of training, practice, and application sections. In the application section, after the instructions are given to the child, the evaluator observes the child's responses and records them accordingly in

the assessment tool. If the child makes the correct move, he or she gets two points; if he or she makes a wrong move and then corrects himself or herself, he or she gets one point; and if he or she makes a wrong move, he or she gets zero points. The total scores range from 0 to 74 for only testing items and from 0 to 118 for both exercises and testing items. It is administered to children individually. In this present study, the application time of the HTKS-R took an average of 9 minutes for each child.

To adapt the HTKS-R scale to Turkish, the necessary permission was obtained. The scale was first translated into Turkish by the researchers. Later, three experts in early childhood examined the translation, and its final version was given in line with their feedback.

The original version of HTKS-R was investigated as single-factor and multi-factor. As a result of the analyses, the researchers emphasized that the one-factor solution represents the optimal solution (Gonzales et al., 2021). This study evaluated the HTKS-R BSR skills assessment tool as a single factor. The values in the later stages of the study reflect the single-factor structure. Accordingly, the adaptation process of the scale into Turkish was structured in two stages: validity and reliability. Validity procedures were performed using criterion validity and predictive validity (Pearson product-moment correlation analysis, regression analysis), structure validity (exploratory factor analysis (EFA), and confirmatory factor analysis (CFA)) to reveal the valid structure of the scale.

Item analysis (Pearson product-moment correlation analysis), analyses for the whole test (standard deviation, variance, mean difficulty level, standard error of the assessment tool), internal consistency coefficients (Cronbach alpha), Split Half, and Guttman Lambda techniques were used to determine the reliability of the scale. The findings regarding the validity and reliability analysis of the HTKS-R, for which the adaptation study was performed, are presented below.

Results Related to Validity Analysis

For the validity analyses of the scale, EFA, CFA, criterion validity-concurrent, predictive validity-, and intra-class correlation coefficients were computed. In the EFA, factor loads of the HTKS-R varied between .51 and .86. The factor loads for part one ranged from .67 to .81. For part two, factor loads were between .62 and .82, for part three between .51 and .86, and the section of the opposition between .56 and .86. In the original version of the scale, the factor loadings ranged from .63 to .92 (Gonzales et al., 2021). It was determined that HTKS-R explained 46% of the total variance. In addition, CFA showed that model fit indices were determined to be at an acceptable level ($\chi 2$ =1839.17, RMSEA = .063; SRMR= .153; CFI = .952; TLI = .968). These results are also like the English version of the scale ($\chi 2$ =1789.56, RMSEA = .057; SRMR= .113; CFI = .991; TLI = .990) (Gonzales et al., 2021). For the criterion validity of the HTKS-R, its relations with the SR Skills Scale (Teacher Form) and its sub-dimensions were examined. Accordingly, a moderate positive correlation was found between HTKS-R and SR Skills Scale of .56, between subscales of WM (r= 58, p< .01), attention (r =.49, p< .01), and IC (r=43; p<.01). In addition, the SR Skills Scale significantly predicted the HTKS-R (R = .32, R^2 =.56; F = 177.12. p<.01). SR Skills Scale explains the HTKS-R total scores at a level of 56%. The results related to the Pearson product-moment correlation analysis between the parts of HTKS-R are presented in Table 1.

Table 1. Pearson Product-Moment Correlation Between Parts of HTKS-R

	P0	P1	P2	P3	HTKS-R
Part 0	1				
Part 1	.536*	1			
Part 2	.319*	.453*	1		
Part 2	.317*	.453*	.897*	1	
HTKS-R	.499*	.847*	.780*	.780*	1

*p<.01

Table 1 indicates that each part of HTKS-R was significantly positively related to all other parts. The sum of the scale shows a moderately positive correlation with part 0 (r=.50). In addition, part 1 (r=.85), part 2 (r=.78), and part 3 (r=.78) show a high level of positive correlation with the sum of the scale. This result is also consistent with the original version of the scale.

Table 2. Intraclass Correlation Coefficient

	Intraclass Correlation	95% Confidence Interval	F Test with True Value 0

		Lower Bound	Upper Bound	Value	df1	df2	P
Single Measures	.434	.399	.473	24.047	387	11223	.000
Average Measures	.958	.952	.964	24.047	387	11223	.000

As seen in Table 2, when HTKS-R is analyzed according to ICC (Intraclass Correlation) criteria, the variances and total variances of the test halves are like each other. In this respect, the HTKS-R is a valid and reliable scale regarding the order of the questions and their structural features. In line with these results, the test has reliable construct validity according to single and average measurements ($p<.01$). These results are consistent with the English version of the scale.

Results Related to Reliability Analysis

The HTKS-R's Cronbach alpha value was .96 for this current study and .97 for the original scale version (Gonzales et al., 2021). The split-half reliability coefficient was .79. According to the Guttman Lambda (Li) method, the reliability coefficients varied between .91 and .94. Additionally, the test-retest reliability was calculated with data collected from 38 children three weeks apart. As a result, the test-retest reliability coefficient of the scale was .81. The item-total correlation values of the scale ranged between .34 and.76, and there was no item with a value below .30 according to the item-total correlation results.

Considering the validity and reliability results of the HTKS-R, the scale can be used to measure behavioral self-regulation skills of 4- to 8-year-old children in a valid and reliable way in Turkey. The findings related to the HTKS-R's adaptation into Turkish were consistent with the original structure of the scale as reported by Gonzales et al. (2021).

Procedures

The researchers received the HTKS-R practitioner certificate after completing the training and evaluation process on the HTKS-R training website. The data collection process continued for five weeks in the fall semester of the 2021-2022 academic year. Four undergraduate students studying in the preschool teaching undergraduate program, trained by the researchers, participated in the HTKS-R data collection process together with the researchers. The agreement criterion between independent observers was used to determine the reliability of the HTKS-R scale. Before the data collection process started, six different observers administered the HTKS-R scale to a group of children who were not among the participants and scored according to the HTKS-R scale. The Kappa coefficient of the agreement was calculated to determine the agreement between independent observers ($\kappa=.91$), which is considered good (Karasar, 2018). Then, the trainees individually administered the HTKS-R scale to the participating children. The children's teachers filled in the STR-S and the SR skills scale.

Ethical Considerations

The Ethics Committee and Ministry of National Education application approval were obtained before starting the study. After obtaining the ethics committee's approval, both written and verbal consent was obtained from the director of the institution, the classroom teacher, and the families of the children. Child consent forms for children, informed consent forms for families, and teacher application permission forms were filled out before starting the study.

Data Analysis

For data analysis, firstly, the normality assumption was examined through the kurtosis and skewness coefficients. The kurtosis values of the dependent and independent variables vary between .44 and -.92, and the skewness values vary between -.04 and -.93. Table 3 contains the kurtosis and skewness values.

Table 3. Kurtosis Skewness Values

	Skewness	Kurtosis

HTKS-R	-.509	-.924
TCR-Conflict	-.584	.697
TCR-Closeness	-.778	.436
Self-Regulation (Teacher Form)	-.554	-.040
Inhibitory Control	-.301	-.596
Attention	-.885	.770
Working Memory	-.926	.297

Based on Table 3, it was seen that the normality assumption was met. The homogeneity assumption was examined with the Levene test. As a result of Levene's test of dependent and independent variables, there was no statistically significant difference between the variances of each measurement group (p>.05), so the homogeneity assumption was met.

Based on these results, Pearson correlation analysis and multiple linear regression analysis techniques were used to reveal the relationship between the BSR and children's socio-demographic variables, and TCR subscales. Due to outliers examined with Mahalanobis and missing data about family income, 97 out of 388 participants were excluded from the data analysis. As a result, the multiple regression analysis was computed with 292 participants. Secondly, the multicollinearity among the independent variables was examined utilizing variance inflation factor (VIF) values. The VIF values for the independent variables were between 1.25 and 1. Field (2013) states that a VIF value below 10 indicates no multicollinearity problem between the independent variables.

Results

This study investigated the predictive power of children's socio-demographic variables and TCR subscales on their BSR skills. The mean scores of the variables, standard deviations, and correlation analysis results of children's BSR, conflict, and closeness are presented in Table 4.

Table 4. HTKS-R, TCR's Subscales and Demographic Variables (N=292)

Variables	$\bar{X}$	SD	HTKS-R (Pearson Correlation)
HTKS-R	31.49	18.37	1
TCR-Conflict	12.27	5.66	-.43*
TCR-Closeness	33.01	4.95	.47*
Child's Age (Months)	60.93	8.13	.13*
Family Monthly Income	6653.27	3547.82	.10*

**p<.05*

As seen in Table 4, the mean scores of the children were 31.49 for the HTKS-R, 12.27 for the conflict, and 33.01 for the closeness. While HTKS-R and TCR's subscales had a statistically moderately negative relationship with conflict (r=-.43, p<0.01), there was a moderately positive relationship with the closeness subscale (r=.47, p<0.01). Additionally, a low positive correlation existed between children's BSR skills and age (r=.13). The results of the multiple linear regression for predicting children's BSR skills by independent variables are given in Table 5.

Table 5. Predictive Variables of BSR Skills

Independent variables	B	S.E	β	t	p	Partial r
(Constant)	-25.186	12.114		-2.079	.038*	
TCR-Conflict	-.870	.192	-.273	-4.527	.000*	-.259
TCR-Closeness	1.330	.258	.311	5.146	.000*	.291
Child's Age (Months)	.304	.118	.131	2.583	.010*	.151
Family Monthly Income	.071	.096	.113	2.251	.025*	.132
Child Gender	.193	1.826	.005	.106	.916	.006
R=.54. R^2=.29; F= 23.34; p<.01						

**p<.05*

Table 5 demonstrates that the independent variables significantly predicted the BSR (R=.54, R^2=.29, F=29.01, p<.01) and explained 29% of its variance. The strongest predictor of the BSR was closeness (ß =.311) followed by conflict (ß =-.273), child age (ß =.131), and family monthly income (ß =.113). Child gender did not contribute significantly to the model (t=-.106; p>.05).

Discussion

The quality of teacher-child interactions plays an essential role in children's SR skills (Vandenbroucke et al., 2018). The results of this study indicated that TCR closeness, TCR conflict, child age, and family income were significant predictors of children's BSR skills.

Teacher-Child Interactions and Behavioral Self-Regulation

The study's findings indicated a correlation between the children's BSR, TCR closeness, and TCR conflict. In other words, consistent with the findings of previous studies (Acar et al., 2021; Salminen et al., 2021), teacher-child closeness is positively correlated with children's BSR skills, and teacher-child conflict is inversely related to children's BSR. Also, TCR conflict and closeness scores significantly predicted children's BSR scores. They were the strongest predictors of BSR skills compared to other independent variables. As in the bio-ecological model (Bronfenbrenner & Morris, 2006), positive dynamics between the teacher and the child are crucial proximal contexts influencing BSR. This finding implies that as teachers' supportive relationships with children increase, the children's abilities to remember and follow instructions (Gathercole & Pickering, 2000), inhibit their strong impulsive reactions in favor of responding appropriately (Diamond, 2013), and shift and maintain their attention between different tasks enhance (Blair & Diamond, 2008). On the other hand, teacher-child relationships characterized by conflict (e.g., a teacher's feeling that he or she and a child struggle with each other) appear to decrease children's working memory, inhibitory control, and attention flexibility skills. Similarly, in a study with toddlers, emotional and behavioral support quality in teacher-child interactions yielded significant associations with effective IC in children. Learning support was associated with better attention and IC in children (Salminen et al., 2021). Coinciding with the findings of previous studies (Acar et al., 2022; Cadima, Verschueren et al., 2016; Li & Lau, 2019; Loomis, 2021; Portilla et al., 2014), the findings of this study highlight the influence of teacher-child relationships on children's BSR skills.

As seen in prior studies, children with improved SR skills establish quality relationships with their teachers, develop positive interactions, and enjoy school and activities (Cadima, Verschueren et al., 2016; Loomis, 2021; Portilla et al., 2014; Silva et al., 2011). Reciprocal relationships were also found between conflicting TCRs and ICs (Berry, 2012). Attention deficits and impulsive behaviors in children substantially affect the TCR quality. Children who exhibit inattention and impulsiveness when they start school experience more conflict with teachers at the end of kindergarten, which continues until the first grade (Portilla et al., 2014). Importantly, some studies emphasize that children with behavioral problems can improve their behavior and SR skills (Acar et al., 2021; Bulotsky-Shearer et al., 2020; Narea et al., 2022). These findings show a need for strategies, such as movement-based activities, play-based interventions, and mindfulness, to help children develop strong SR skills during preschool education (Savina, 2021).

Socio-Demographic Variables and Behavioral Self-Regulation

The findings showed that children's BSR skills were positively, but at a low level, correlated with age and family monthly income. Also, independent variables (closeness, conflict, age, family income, and gender) significantly predicted BSR skills, except for child gender. This result coincides with other studies' findings (Ertürk-Kara & Gönen, 2015; Salminen et al., 2021; Whitebread & Basilio, 2011). For example, Salminen et al. (2021) demonstrated that older children perform better in selective attention and IC and have better behavior regulation skills than younger ones. Another finding of this study was that the family's income was a significant predictor of children's BSR skills, which is consistent with previous studies' findings (Cadima et al., 2016; Li et al., 2017). For instance, Li et al. (2017) found a correlation between family income and cognitive SR. They stated that cognitive SR was more strongly associated with family income than emotional SR. Also, gender did not significantly contribute to the BSR skills, which coincides with other research results (Son et al., 2013; Tominey & McClelland, 2013). On the other hand, this finding is inconsistent with other studies' findings indicating the existence of gender differences in children's SR skills (İvrendi & Erol, 2018; Matthews et al., 2014; Salminen et al., 2021; Wanless et al., 2013; Yamamoto & Imai-Matsumura, 2017). For instance, one study found that boys have weaker IC and behavior regulation skills than girls (Salminen et al., 2021). Although more research is needed, such inconsistencies about gender may stem from the participants' features, such as the culture in which children grow up or teachers' instructional approaches.

Limitations and Recommendations

This study has several limitations along with its informative results. First, this study was conducted with limited participants due to the ongoing pandemic. Other studies can be conducted with more participants to increase the generalizability of the results obtained from the study. Second, in this study, the SR skills scale and the TCR scale were filled in by teachers on behalf of children, and children's BSR skills were assessed using a task-based direct assessment tool. In addition to these assessment methods, observation-based data can be collected in future studies to obtain detailed information about TCR.

The results have some implications for researchers and teachers. The TCR's subscales predicted children's BSR skills in this current study. Therefore, other studies can be planned longitudinally to explore the relationship between the quality of the TCR and the development of children's BSR skills at time points from early childhood education to primary school entry. Additionally, this study examined only children's BSR skills and TCR subscales. Upcoming studies may investigate children's BSR skills with other teacher variables, such as teachers' approaches to classroom management and instructional beliefs. Teacher professional development programs may focus on intervention programs that strengthen the TCR and SR.

Author (s) Contribution Rate

First Author: Conceptualizing, methodology, data collecting, analysis and interpretation of data, and writing-original draft.
Second Author: Methodology, data collecting, analysis and interpretation of data, and writing-original draft.
Third Author: Writing-review, supervision, and editing.

Conflict of Interests

The authors have no conflicts of interest to declare relevant to this article’s content.

Ethical Approval

The Ethics Committee approval (14.07.2021-E.77254) from Pamukkale University and the Provincial Directorate of National Education approval was obtained before starting the study.

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The Relationship between Teachers' Perceptions of Compliance with the Psychological Contract and School Administrators' Empowering Leadership Behaviors

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The Relationship between Teachers' Perceptions of Compliance with the Psychological Contract and School Administrators' Empowering Leadership Behaviors

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Abstract

The aim of this study is to determine the relationship between school administrators' empowering leadership behaviors and secondary education (high school) teachers' perceptions of compliance with the psychological contract. The population of the study consists of 2,878 teachers who were working at 47 high schools located in central Elazığ during the 2019–2020 school year. The sample for the study consisted of 470 teachers selected from 12 schools using the stratified sampling method. Data were collected using the "Scale for School Administrator Compliance with Psychological Contract" developed by Koçak (2016) and the "Scale for Teacher Compliance with Psychological Contract". Teacher perceptions of the level to which school administrators displayed empowering leadership behaviors were measured using the Empowering Leadership Behaviors Scale developed by Konczak, Stelly, and Trusty (2000) and adapted to Turkish by Aras (2013). It was found that teachers had high perceptions of school administrator compliance with the psychological contract (SACPC) and that they also had a high level of compliance with the psychological contract (STCPC). Additionally, it was found that teacher perceptions of school administrators displaying empowering leadership behaviors (OYGLD) were also high. Perceptions of teachers who had been working for 7–11 years in the same school regarding school administrator compliance with the psychological contract were higher than those of teachers who had been working in the same institution for 2–6 years. A moderately positive and significant relationship was found between school administrators' and teachers' compliance with the psychological contract and administrators' empowering leadership behaviors. Reinforcing the leadership behaviors of school administrators; does not have a significant effect on coaching sub-dimensions for decision-making, knowledge sharing, and innovative performance on its own.

Keywords: Psychological contract, Compliance with psychological contract, Employee empowerment, Empowering leadership behaviors.

Introduction

The foundations of the psychological contract, which is unwritten and refers to the perceptions of employers and employees regarding their mutual obligations, were laid with job analysis studies conducted by management scientists between 1910 and 1930, human relations studies between 1930 and 1950, and behavioral science studies in the period after the 1950s (Campbell, Bridges, Corbally, Nystrand, & Ramseyer, 1971, p. 112). Argyris (1960, p. 96), who first addressed the concept as a psychological employment contract, studied factory workers and concluded that employees display high performance when the employer respects them and gives them autonomy in the workplace. After this study, the concept was further crystallized in field studies by Levinson, Price, Munden, Mandl, and Soley (1962). Later, Schein (1965) and Kotter (1973) followed the definition made by Levinson et al. and defined it on the basis of an incentive pattern between the employer and employee. In the 1980s, global economic integration and the transformations in the economic structures of states made radical change necessary in the management philosophies of organizations and their functioning (Capelli, Bassi, Katz, Knoke, Osterman, & Oseem, 1997; Özdemir, 2011). Institutional mergers, changes in employee

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roles, and the initiation of new management practices gave a new dimension to the relationship between the organization and employees and human behaviors (Mao, Liu, & Ge, 2008; Özdemir, 2014). Accordingly, it has been reported since the 1980s that organizational and employee needs and mutual obligations have developed significantly (Baker, 2009) and that important changes have occurred in the nature of employment relations (Capelli, Bassi, Katz, Knoke, Osterman, & Oseem, 1997, p. 209). Along with these changes in employment relations that mainly concern the individual, the psychological contract has taken on a different meaning from its early definitions. The concept, which was initially based on the totality of mutual expectations, evolved into an understanding of individual perceptions of mutual expectations under Rousseau's influence (1995). After this period, the psychological contract has become the basis for subjective definitions concerning the individual.

Rousseau and Schalk (2000, p. 1) suggest that the psychological contract is a belief system regarding the obligations between the organization and the employee. According to Rousseau and Tijoriwala (1998), psychological contracts appear when employees believe that a promise has been made and agree to fulfill the obligations that fall upon them in return for this promise.

Sometimes defined as the totality of unwritten obligations based on subjective beliefs, the concept (Robbins and Judge, 2013, p. 312) is based on promises that are believed to have been given and the perceptions of whether these promises are fulfilled (Robinson & Rousseau, 1994). Based on this, teachers may be said to have a set of beliefs regarding the material and moral opportunities and managerial behaviors that the school will provide in return for the instructional and administrative services they provide. In this sense, there is a sense of reciprocal, unwritten, psychological obligation in the relations between teachers and school administrations.

Konczak, Stelly, and Trusty (2000) define empowering leadership behaviors as coaching for giving authority, responsibility, self-determination, knowledge sharing, skill development, and innovative performance. On the school administration's part, it is necessary to (1) ensure that teachers are given authority and responsibility in matters related to instructional activities; (2) create a safe environment in which they can take initiative in educational activities; and (3) openly share the information required for the academic and administrative functioning of the school so that living schools can be created. In addition, it is also necessary to offer development opportunities that will allow teachers to respond to new approaches in education and the evolving performance demands of the profession (Koçak, 2016).

Pont, Nusche, and Hopkins (2012, pp.136-137) found in their study that effective leadership in schools can happen through sharing leadership roles and responsibilities with teachers. They also emphasized that such leaders value development and empowerment. In addition, they stated that leaders in successful schools devote most of their time and energy to the development of teachers, delegate authority to them, and coach them by providing feedback. In the literature, there are theoretical studies dealing with the empowerment of employees in organizations, leadership behaviors related to this, and how these behaviors are reflected on employees, the organization, and the quality of work life (Öztürk and Özdemir, 2003; Yüksel and Erkutlu, 2003; Dogan and Kılıç, 2007; Çavuş, 2008; Demirbilek, 2008; Özel, 2013; Karakaş, 2014), as well as studies on employee empowerment methods and problems experienced in these (Çuhadar, 2005; Akçakaya, 2010; Yukl & Becker, 2012). In addition, there are also studies in the literature on how empowering leadership behaviors affect psychological empowerment (Arslantaş, 2007; Altındiş and Özutku, 2011). These studies argue that empowering leadership behaviors increase organizational effectiveness by empowering employees and emphasize that such behaviors are a necessity for today's organizations.

In studies on teacher empowerment in schools, the focus has been to investigate how these behaviors of school administrators are reflected on teachers. Cerit (2007), in a study that determined the levels of school principals' empowering leadership behavior towards teachers, concluded that according to teacher perceptions, empowering leadership behaviors occurred at a moderate level. Parlar (2012), on the other hand, reached the conclusion that teacher empowerment is an issue neglected or not understood by school administrators. However, a qualitative study found that supportive and empowering leadership behaviors are important in helping teachers develop positive attitudes and feelings about their school relations and the profession (Argon, 2014).

Özdemir (2014, p. 6) argues that effective human resources management in school organizations can only be possible if the expectations of the employees are met at the highest level. Rong (2009) states that these expectations are not only economic but are also socially based. In this sense, in return for the fulfillment of expectations such as career opportunities, material and moral awards, status, and development opportunities, the individual will also make a true effort for the institution, display their talents and skills, and show loyalty and commitment to the organization (Griffin and Moorhead, 2014, p. 64). Kotter (1973), on the other hand, presents a broader perspective and lists employee expectations from the institution as opportunities for personal development, job enrichment, opportunities for diversification of skills, status, and prestige, a collaborative environment, a disciplined, fair, and orderly work environment, the ability for promotion, and an effective feedback system. He lists the expectations of the organization from the individual as reaching results by

working effectively and efficiently, continuous knowledge and skill development, effective time management, benefiting the institution, adopting its aims, working effectively with subordinates and superiors, showing loyalty, and being committed to the institution.

In this study, the psychological contract in schools included the mutual expectations of school administration and teachers. The expectations of teachers from the school included care for their personal happiness, understanding and fairness, fulfillment of their education and development demands, guidance in the school, recognition and rewarding of their efforts, and inclusion in decision processes. On the other hand, the expectations of the school from the teachers were investigated in terms of "effort for institutional development", "loyalty" and "extra performance". Of these, effort for institutional development is related to teachers' use of their professional knowledge and skills to improve school success and prestige. The loyalty dimension is evaluated within the framework of feelings such as continuing to work at school until the retirement of teachers, seeing school problems as their own problems, and owning the school by defending it against others. Until their retirement, they saw school problems as their own and owned the school by defending it against others. Extra performance, on the other hand, was explained as teacher behaviors showing a will to work extra hours outside of expected or legally assigned duties (Koçak ve Burgaz, 2017).

Empowering Leadership Behaviors

The concept of personnel empowerment, which refers to the support provided to employees by management, was first introduced by Block (1986). Personnel empowerment is broadly defined as allowing an employee the authority to make decisions on issues within their work area without orders or approval from a superior (Bowen and Lawler, 1992; Luthans, 2011). In another definition, it refers to providing employees with powers that will motivate them to work most effectively for their organization (Thomas and Velthouse, 1990).

Dogan (2003) lists some of the factors that can be taken into account in the empowerment of employees as participation in management and decision-making, delegation of authority and responsibility, information sharing, innovation, education, and training. Participation in management is defined as employees taking part in determining the actions that need to be taken in line with organizational purposes, in determining the way forward, and in various managerial actions (Rodrigues, 1994). In different definitions in the literature, it is associated with the active role of the employees in the decision-making process, their contribution to this process, and being responsible for the decisions taken (Eren, 2008; Koçel, 2007). The organizational benefits of employee participation in decisions are embracing the decisions taken and ensuring compliance, reinforcing a sense of entrepreneurship, preventing unnecessary conflicts, instilling self-respect and self-confidence in employees, and making full use of potential (Mıhçıoğlu, 1983). Delegation of authority is the transfer of a manager's rights to employees while still holding the manager responsible for results (Yüksel and Erkutlu, 2003) .

Information sharing, which is another empowering factor, refers to results achieved being in line with predetermined objectives. In other words, it refers to the gap between output and criteria not being large and employees having access to all necessary information about their jobs. If managers share the necessary information openly with their subordinates, it will be possible to create an environment of trust within the organization, and in this way, employees will be able to take responsibility and be innovative (Rothstein, 1995). Encouraging innovation is another important empowerment element through which managers can use the talents, skills, and perspectives of their employees and their entrepreneurial potential and turn this into a benefit for the organization (Gebert, Boerner, & Kearney, 2006). Another important factor to be considered in the empowerment of employees is the provision of educational opportunities that will help individuals carry out their duties effectively. Lincoln, Travers, Ackers, and Wilkinson (2002) see education and training as one of the most powerful elements in employee empowerment.

Even though no studies seem to exist that examine the relationships between the psychological contract and empowering leadership in schools (with the exception of the doctoral thesis by Koçak and Burgaz in 2016), the literature includes two studies investigating the relationship between empowering leadership behaviors perceived by employees in different private sectors and showing extra performance (a dimension of the psychological contract). These studies (Raub, 2012; Humborstad, Nerstad, & Dysvik, 2014) have found that empowering leadership behaviors affect employees' extra-performance levels (Koçak & Burgaz, 2017).

All the studies examined show how important the psychological contract and empowering leadership behaviors are for organizations. On the other hand, they also reveal problems in the perceptions of teachers towards the psychological contract and that their expectations are not sufficiently met (Güneş, 2007; Güzelce, 2009; Yılmaz and Altınkurt, 2012; Özdemir and Demircioğlu, 2015; Koçak and Burgaz, 2017). This situation brings to mind the question of what needs to be done in order to improve teachers' perceptions of the psychological contract. At

this point, it is a matter of curiosity whether empowering leadership behaviors are effective in teachers' perceptions of psychological contract. Although there are studies in the literature that explore the relationships between employee empowerment and the psychological contract (Paul, Niehoff, & Turnley, 2000; Kun, Hai - yan & Lin-li, 2007), there is only one empirical study on empowering leadership behaviors and teacher perceptions of the level of compliance with the psychological contract (Koçak and Burgaz, 2017).

For this reason, it is necessary to examine the empowering leadership behaviors that may affect the perceptions of psychological contracts in schools in a positive way.

Purpose

The aim of this study is to determine the relationship between the empowering leadership behaviors of school administrators and the perceptions of teachers working in secondary education institutions (high schools) to comply with the psychological contract. For this purpose, answers were sought to the following questions regarding the perceptions of school administrators and teachers regarding the level of compliance with the psychological contract and the empowering leadership behaviors of school administrators:

1. a. Teachers' and school administrators' compliance with the psychological contract,

   b. Showing the empowering leadership behaviors of teachers and school administrators,

   c. What are the perceptions of teachers regarding their own psychological contract compliance levels?

2. Do teachers' perceptions of school administrators' level of compliance with the psychological contracts differ significantly according to their tenure at the school?

3. According to teachers' perceptions, is there a significant relationship between school administrators' level of compliance with the psychological contract and their level of compliance with the psychological contract?

4. According to teachers' perceptions, are school administrators' levels of compliance with the psychological contract and their empowering leadership behaviors significant predictors of teachers' levels of compliance with the psychological contract?

Method

As this study focused on the relationships between teacher perceptions of psychological contract and empowering leadership behaviors, a relational survey model was used. Within the framework of this model, quantitative techniques were used in the analysis of the obtained data.

Population and Sample

The population of the study comprised 2878 teachers working at 47 public high schools in the center of Elazığ during the 2019-2020 school year. The sample included 470 teachers selected via stratified sampling from 12 schools. The scales were distributed to the teachers working at the selected schools, and volunteer teachers were asked to fill in the scales with the knowledge of the school administration. Of the 470 data collection tools distributed by the researcher, 359 were returned, and 352 were included in the evaluation as the rest were excluded due to incomplete data. The sample size was calculated based on the 95% confidence interval, and the result showed that the sample size should be at least 341 (Krejcie and Morgan, 1970). Stratified sampling was used as the sampling method, and data were collected from all 12 of the selected schools. The number of teachers to be included in the sample was calculated based on the ratio of the teachers working in the selected high schools to the entire population. Personal information about the 352 teachers included in the sample is presented in Table 1.

Table 1. Personal information of the teachers in the sample

Gender	Frequency	Percentage
Male	225	63.9
Female	127	36.1

Years of experience		
1-5 years	67	19.0
6-10 years	61	17.3
11-15 years	52	14.8
16-20 years	72	20.5
21 years and more	one hundred	28.4
Educational Status		
University graduate	281	79.8
Postgraduate	71	20.2
Branch		
Social studies	169	48.0
Science	117	33.2
Special Ability	66	18.8
Duration of service at the school of study		
0-1 year	50	14.2
2-6 years	158	44.9
7-11 years	78	22.2
12-16 years	34	9.7
17-35 years	32	9.1

As shown in Table 1, 63.9% of the 352 teachers included in the study were male and 36.1% were female. Of the teachers, 19.0% had 1–5 years of teaching experience, 17.3% had 6–10 years, 14.8% had 11–15 years, 20.58% had 16–20 years, and 28.4% had 21 years or more. 79.89% of the teachers were university graduates, and 20.2% were postgraduates. 48.0% were teaching social sciences, 33.2% science, and 18.8% special ability. The duration of service at the school was 0–1 year for 14.2% of the teachers, 2–6 years for 44.9%, 7–11 years for 22.2%, 12–16 years for 9.7%, and 17–35 years for 9.1%.

Data Collection Tool

The Psychological Contract Perceptions of School Administrators were determined by the School Administrators' Level of Compliance with the Psychological Contract Scale developed by Koçak (2016). As a result of the reliability analysis, the Cronbach's Alpha coefficient of the single factor scale was calculated at .96. The factor patterns of the scale varied between .66 and .82, and it had a 25-item, single-factor structure. It was seen that the scale explained 57% of the total variance. Validity and reliability studies of the scale were carried out. The Goodness-of-fit results in the DFA conducted for structural validity were [χ 2 = 1187.65; Sd = 274; χ 2 /Sd = 4.33; AGFI =0.79; GFI=0.83; NFI=0.98; CFI=0.98; IFI=0.98; RMR = 0.034; RMSEA = 0.08]. The Cronbach's Alpha (α) value of the scale was calculated as .97. Considering the results of goodness of fit and reliability coefficients, it was concluded that the School Administrators' Level of Compliance with the Psychological Contract Level Scale is a valid and reliable tool for the study (Çelik and Yılmaz, 2013). In this study, as a result of the reliability analysis, the Cronbach's Alpha coefficient for the single-factor scale was calculated at 0.98. The factor loads of the scale vary between .57 and .78 and it has a single factorial structure with 25 items. The scale explained 58% of the total variance.

Teacher perceptions of psychological contract at the school were determined by Koçak's 'Teachers' Level of Compliance with the Psychological Contract Scale" (2016). A 26-item, 3-factor scale was obtained, with factor sizes varying between .47 and .72, which explained 53% of the total variance. As a result of the reliability

analysis, Cronbach's Alpha coefficients for the three-factor scale were as follows: .89 for the "effort for institutional development" factor (11 items); .84 for the "extra performance" factor (9 items); and .80 for the "loyalty" factor (6 items). The value for the total scale was .93. The goodness of fit values as a result of the CFA conducted to test the structural validity of the Teachers' Level of Compliance with the Psychological Contract Scale were χ 2 = 788.44; Sd = 295; χ 2 /Sd = 2.67; AGFI=0.80; GFI=0.82; NFI=0.98; CFI=0.99; IFI=0.99; RMR=0.037; RMSEA=0.07]. When the obtained goodness of fit results and reliability coefficients were evaluated, the relevant scale emerged as a valid and reliable tool for this research (Çelik and Yilmaz, 2013). In this study, as a result of the reliability analysis, the Cronbach's Alpha coefficient of the total scale was .92. A 26-item, 3-factor scale was obtained with factor loads ranging between .54 and .74, accounting for 56 % of the total variance of the scale. The Cronbach Alpha reliability value of the first factor of the scale was .93, the second factor was .78 and the third factor was .74. Factors were named parallel to the original scale.

The Empowering Leadership Behaviors Scale used to measure teachers' perceptions of empowering leadership behaviors was adapted to Turkish by Aras (2013). The scale with 18 items has the following dimensions: "authorization and responsibility", "decision-making", "knowledge sharing", "skills development" and "coaching for innovative performance". The necessary analyses were performed while adapting the tool, and the scale was found to be valid and reliable (χ 2 / df = 2.710 (p >05); CFI = .908 ; TLI =.885; RMSEA = 0.068). The reliability coefficients for the dimensions were .67, .64, .71, .77 and .73, respectively, and the reliability coefficient for the total scale was calculated as .89. In the present study, the reliability coefficients of the sub-dimensions were .86, .89, .92, .94 and .95, respectively. For the total scale, it was .97.

Procedures and Data Analysis

The necessary permissions were obtained from the researchers for all the scales used before the data were collected. The data were analyzed using the SPSS for Windows 21 package. Frequencies and percentages were used to determine the demographic characteristics (gender, branch, years of experience, educational status, years of service at the school, school, and place of work) in the school administrators' level of compliance with the psychological contract scale, teachers' level of compliance with the psychological contract scale, and the empowering leadership behaviors scale. In order to prepare the data for analysis, single-variable and multi-variable analyses were performed, and whether the data showed a normal distribution was examined. Scatter plots, kurtosis, and skewness coefficients showed that the data had a normal distribution and were suitable for multivariate analysis. As the mean of skewness and kurtosis values were in the range of -1.96- + 1.96, this means that the skewness or kurtosis have a value that includes 95% of total values. In other words, this means that they are not among the 5% of extreme values. Therefore, the distribution was accepted to be normal (Morgan, Leech, Gloeckner, & Barret, 2004, p. 49; Can, 2014, p. 85). The simple and dual correlation coefficients between the independent variables were examined, and it was seen that there was a low relationship between 0.00 and .30. Gujarati (1995) states that a CI (condition index) value between 0.00 and .30 is an indicator of a low-level multilinear connection problem (Can, 2014, p. 85; Tabachnick and Fidell, 2007, p. 253). Mean and standard deviation values were used in the descriptive analysis of the data, and multi-correlation analysis was used to reveal the relationships between the variables. Hierarchical regression analysis was used to test the predictors of teachers' psychological contract compliance levels. In the hierarchical method, predictive variables are analyzed according to an order previously determined by the researcher, and each variable is evaluated in terms of its contribution to the variance of the dependent variable. In this method, independent variables are analyzed block by block, and each one contains one or more independent variables (Green, Salkind, and Akey 1997). Data analysis with this method has been explained in Table 4.

When interpreting arithmetic averages, 1.00-1.79 was considered very low, 1.80-2.59 was considered low, 2.60-3.39 was considered medium, 3.40-4.19 was considered high, and 4.20-5.00 was considered very high. Correlation coefficients between variables were considered high if they were between 0.71-1.00, moderate if between 0.70-0.31, and low if between 0.30-0.00 (Büyüköztürk, 2007, p. 32). The independent group t-test was performed in order to determine whether there was a significant difference between the views expressed based on the variables of gender and education level. Also, a one-way analysis of variance (ANOVA) was performed to determine whether there was a significant difference between the means of the groups in terms of the variables of branch, seniority, and duration of service at the school. The significance level of the tests was taken as .05.

Findings

1. Findings Regarding the Levels of Administrator Compliance with the Psychological Contract, Demonstrating Empowering Leadership Behaviors, and Teacher Compliance with the Psychological Contract According to Teacher Perceptions

Table 2 presents the descriptive statistics on psychological contracts and empowering leadership behaviors according to teacher perceptions.

Table 2. Descriptive statistics on variables

Dimensions and Sub-Dimensions	n	$\bar{X}$	**SS**
1. SACPC **(**School Administrators' Level of Compliance with the Psychological Contract)	352	3.64	.98
2. STCPC **(**School Teachers' Level of Compliance with the Psychological Contract)	352	3.77	.66
Effort for Institutional Development	352	3.70	,93
Loyalty	352	4.05	.75
Extra Performance	352	3.64	.82
3. ELB (Empowering Leadership Behaviors)	352	3,51	.72
Delegation and Responsibility	352	3.75	.84
Decision-Making	352	3.69	1.08
Information Sharing	352	3.77	1.01
Skills Development	352	3.67	1.07
Coaching for Innovative Performance	352	3.64	1.06

As seen in Table 2, teacher perceptions of administrators' level of compliance with the psychological contract (SACPC) ($\bar{X}$ = 3.64) and teachers' level of compliance with the psychological contract (STCPC) were at a high level ($\bar{X}$ = 3.77). In addition, it was found that the teachers' perceptions of school administrators' level of showing empowering leadership behaviors (GLD) were at a high level ($\bar{X}$ = 3.51). Although the averages of the teachers' behaviors related to the level of compliance with the psychological contract were high in all sub-dimensions, the highest average was in loyalty ($\bar{X}$ =4.05), the lowest average was in extra performance ($\bar{X}$ = 3.64), and the median was in effort for institutional development ($\bar{X}$ = 3.70). In addition, according to the teachers, the empowering leadership behaviors of school administrators were ordered as follows from the highest to the lowest: information sharing ($\bar{X}$ = 3.77), empowerment and responsibility ($\bar{X}$ = 3.75), decision-making ($\bar{X}$ = 3.69), skills development ($\bar{X}$ =3.67) and coaching for innovative performance ($\bar{X}$ = 3.64).

2. Do teachers' perceptions of their own level of compliance with the psychological contract differ significantly based on their years of service at the school? The results of the ANOVA conducted for this question can be seen below.

Table 3. Teacher perceptions of the level of compliance with the psychological contract based on their duration of service at the school

Variables		N	$\bar{X}$	Source of Variance	Sum of squares	sd	Mean of Squares	F	P	Difference
Term of Service at School										
Ö PSUD SCALE	0-1 years (1)	50	3.69	Between groups	4,273	4	1,068	2,489	,043	2-3
	2-6 years (2)	156	3.70	Within groups	148,048	345	,429			
	7-11 years (3)	78	3.97	Total	152,321	349				
	12-16 years (4)	34	3.74							
	17 years and above (5)	32	3.77							

As can be seen in Table 3, as the condition for equal group variances was satisfied (the significance of the Levene test was p = 0.640 > 0.05) and as the number of groups was high, the Tukey test was performed. According to the results of the significance test of the f value, the null hypothesis that there was no significant difference between the means of the groups because the p value was less than 0.05 was rejected. According to the results of the Tukey test, the groups with a significant difference were teachers with 7–11 years and 2–6 years of service in the same school. The perceptions of teachers with a service period of 7–11 years in the same school regarding school administrators' level of compliance with the psychological contract were higher than those with 2–6 years of service.

Table 4. Teacher perceptions of the level of compliance with the psychological contract in the performance subdimension based on their duration of service at the school

Variables		N	$\bar{X}$	Source of variance	Sum of squares	sd	Mean of squares	F	P	Difference
Term of Service at School										
Performance Sub-Dimension	0-1 years (1)	50	3.42	between groups	5,494	4	1,374	2,693	,031	2-3
	2-6 years (2)	158	3.45	within groups	176,984	347	,510			
	7-11 years (3)	78	3.74	Total	182,478	351				
	12-16 years (4)	34	3,54							
	17 years and above (5)	32	3.44							

As can be seen in Table 4, the Tukey test was conducted following a significant Anova test result, and a significant difference was found to exist between the teachers with 2–6 years and 7–11 years of service. The perceptions of teachers with a service period of 7–11 years in the same school regarding the level of compliance with the psychological contract by school administrators were higher than those with 2–6 years of service.

3. According to teachers' perceptions, is there a significant relationship between school administrators' and their own levels of compliance with the psychological contract? Findings for this sub-question are given in Table 5.

Table 5. Pearson correlation matrix for the relationship between variables

Variables		1.	2.	3.	4.	5	6.
1. OYSUD SCALE		1 352					
2. ÖPSUD SCALE		,654** ,000 350	1 350				
3. GLD SCALE		,863** ,000 352	,666** ,000 350	1 352			
ÖPSUD Scale Sub - Dimensions	4. Effort for Institutional Development	,627** ,000 351	,910** ,000 350	,632** ,000 351	1 351		
	5. Loyalty	,676** ,000 351	,880** ,000 350	,692** ,000 351	,771** ,000 350	1 351	
	6. Extra Performance	,408** ,000 352	,803** ,000 350	,420** ,000 352	,532** ,000 351	,572** ,000 351	1 352

**The correlation is significant at the 0.01 level (2-tailed).

The correlation coefficients displayed in Table 5 mean that positive and significant relationships exist between school administrators' level of compliance with the psychological contract scale (SACPC), teachers' level of compliance with the psychological contract scale and its subdimensions, and the school administrators' empowered leadership behaviors scale (ELBS). A moderate, significant, and positive relationship was also detected between the SACPC and the STCPC scores ($r = 0.654$, $p < 0.01$). Accordingly, it can be said that as SACPC increases, so does STCPC. When the correlation coefficient ($r^2 = 0.42$) is taken into account, it can be seen that 42% of the total variance in teachers' compliance with the psychological contract levels originates from school administrators' compliance levels with the psychological contract.

There is a strong, significant, and positive relationship between school administrators' empowered leadership behaviors (OYGLD) and psychological contract compliance scores ($r= 0.863$, $p<0.01$). It can therefore be said that as OYGLD increases, so does SACPC. When the correlation coefficient ($r^2 = 0.74$) is taken into account, 74% of the total variance in school administrators' levels of compliance with the psychological contract originates from their own empowering leadership behaviors.

There is a moderate, significant, and positive relationship between school administrators' empowered leadership behaviors (OYGLD) and teachers' scores for compliance with the psychological contract ($r= 0.666$, $p < 0.01$). Once again, it can be said that as OYGLD increases, so does STCPC. When the correlation coefficient ($r^2 = 0.44$) is taken into account, 44% of the total variance in the levels of teacher compliance with the psychological contract stems from the administrators' empowering leadership behaviors.

On the other hand, a moderate, positive, and significant relationship was found between the following sub-dimensions of SACPC and LPSUD: effort for institutional development ($r = 0.627$, $p < 0.01$), loyalty ($r= 0.676$, $p < 0.01$) and extra performance ($r= 0.408$, $p < 0.01$). As can be understood, as SACPC increases, so does teacher compliance in the sub-dimensions of the scale (STCPC).

4. According to teacher perceptions, are school administrators' compliance levels with the psychological contract and their empowering leadership behaviors significant predictors of teacher compliance levels with the psychological contract? Findings regarding this question are given in Table 6.

Table 6. Hierarchical regression results about the prediction of SACPC, GLD, and certain variables by SPSUD Teachers' Levels of Compliance with the Psychological Contract

Predictive Variables	**B**	**Standard Error B**	**β**	**T**	**p**	**paired r**	**partial r**
Constant	1,862	.119	-	15,672	,000	-	-
SACPC	,214	,051	,321	4,190	,000	,654	,161
Delegation and responsibility	,175	,050	,225	3,524	,000	,621	,135
Decision-making	,034	,061	,052	,555	,579	,604	,021
Sharing information	-,011	,064	-,016	-,166	,869	,611	-,006
Skills development	,227	,066	,369	3,448	,001	,657	,132
Coaching for innovative performance	-.121	,067	-,195	-1,795	,074	,609	-,069
$R=0.703$ $R^2=0.494$ $F_{(6, 343)}= 55.993$ $p=.000$							

When the paired and partial correlations between the predictors and the dependent variable in Table 6 were examined, a positive and moderate relationship (r = 0.65) could be seen between the SACPC and the teachers' level of compliance with the psychological contract (STCPC). However, when the other variables were checked, the correlation between the two variables was calculated as r = .16. Similarly, a positive and moderate relationship (r = 0.62) existed between delegation and responsibility and LPSUD, but when other variables were considered, the correlation between the two variables was r = .13. It was found that there was a positive and moderate relationship (r = 0.60) between decision-making and LPSUD, but when other variables were added, the correlation between the two variables was calculated as r = 0.02. A positive and moderate relationship (r = 0.61) was detected between information sharing and LPSUD, but with the other variables, the correlation was r = -.006. A positive and moderate relationship (r= 0.65) existed between skills development and LPSUD, but when the other variables were checked, the correlation was calculated as r = .13. In innovative performance, there was a positive and moderate relationship (r = 0.60) between coaching and LPSUD, but when other variables were considered, the correlation between the variables was calculated as r = - . 06 . R = 0.703, R2 = 0.494, P<.01. These six variables together explained approximately 49% of the total variance in teacher levels of compliance with the psychological contract.

According to the standardized regression coefficient (β), the order of relative importance of the predictor variables on teachers' levels of compliance with the psychological contract was as follows: skills development, SACPC, delegation and responsibility, coaching for innovative performance, decision-making, and knowledge sharing. When the t-test results related to the significance of the regression coefficients were examined, it was found that the variables of SACPC, delegation and responsibility, and skills development were significant predictors of teacher compliance with the psychological contract. It is seen that it is a significant predictor of the level of fit to function (STCPC). Decision-making, information sharing, and coaching for innovative performance did not seem to have a significant effect. Based on the results of the regression analysis, the equation related to the prediction of the teachers' level of compliance with the psychological contract is given below.

STCPC = 1,862 + ,214 SACPC + ,175 Delegation And Responsibility + ,034 Decision-Making, 011b Sharing Information + ,0227 Skills Development - ,121 Coaching For Innovative Performance

Results and Discussion

This study, which focused on the role of empowering leadership behaviors on teacher perceptions towards the psychological contract in schools, first examined the level of teacher perceptions regarding the psychological contract and empowering leadership behaviors. It was found that when teachers have a high perception of school administrators' level of compliance with the psychological contract, they also have a high level of compliance with it. In a study by Yılmaz and Altınkurt (2012), private tutoring teachers stated that their institutions only fulfilled their obligations towards their employees at a moderate level. At the same time, they stated that they

fulfilled their own obligations towards their institutions at a very high level in all dimensions. In another study conducted by Çildir (2008), it was found that teachers felt a high level of responsibility towards their schools, but the administration responded to their services at a moderate level. According to the findings of another research conducted by Koçak and Burgaz (2017), although teachers had a high general level of compliance with the psychological contract, their perceptions in the dimensions of "extra performance" and "loyalty" were at a moderate level. It was found that the dimension of "effort for institutional development" increased the overall average, which means that the teachers were most active in the dimension of effort for institutional development consisting of behaviors for increased student development and success. On the other hand, they were less inclined to put in more effort than expected and be loyal to the school. This may be viewed as a reaction from teachers to school administrators' inability to comply with the psychological contract. In the present study, on the other hand, the sub-dimensions of loyalty, extra performance, and effort for institutional development all had high levels of compliance with the psychological contract. Our findings therefore do not corroborate those of the previous study.

According to Gouldner's (1960) reciprocity norm and Blau's (1964) social exchange theory, individuals are more giving when they get something they expect to receive in return. In addition, the ability of employees to perform their duties effectively is associated with the provision of the conditions or incentives they expect (Huffington, Cole, and Brunning, 1997). This may be why teachers put a high level of effort into institutional development, which is closely related to student success; however, they may have a decreased tendency to show extra performance and loyalty as they think that school administrators fulfill their responsibilities only at a moderate level (Koçak and Burgaz, 2017).

According to the variable of seniority, teachers' perceptions of school administrators' level of compliance with the psychological contract did not reveal a significant difference. Likewise, in a previous study conducted by Yılmaz and Altınkurt (2012), no difference was found according to seniority in the opinions of the teachers in the subdimensions of institutional obligations (working conditions, job characteristics, justice) and employee obligations (being a member of the institution, basic professional standards, and relational contract).

In the present study, it was found that the teachers had high perceptions of school administrators' empowering leadership behaviors (GLD). According to the perceptions of the teachers, the empowering leadership behaviors of school administrators were at a high level in all sub-dimensions as well. In a study by Cerit (2007), however, it was concluded that, according to the perceptions of the teachers, school administrators showed only moderately empowering leadership behaviors. The findings therefore diverge from each other.

The present study thirdly studied the relationship between teachers' and school administrators' levels of compliance with the psychological contract and found a moderate, significant, and positive relationship. However, there was a high, significant, and positive relationship between school administrators' empowering leadership behaviors (OYGLD) and psychological contract compliance scores. At the same time, a moderate, positive, and significant relationship was spotted between SACPC and the following sub-dimensions of SACPC: effort for institutional development, loyalty, and extra performance. The concept of the psychological contract was built on the basis of mutual satisfaction of obligations between employees and the employer (Rousseau, 1989, 1995). The theoretical basis of the concept is the expectation theory (Vroom, 1964), which states that individuals believe they will receive a valuable reward in return for their efforts. According to this theory, teachers expect a management approach that will respond to their material and moral needs from the school administration in return for the services they provide. The same is true for the school administration. Otherwise, if either side perceives their expectations as not being met and not likely to be met in the future either, they may tend to decrease or withdraw their efforts (Koçak & Burgaz, 2017). In this study, the fact that there is a positive and significant relationship between the levels of compliance with the psychological contract by both sides confirms the basic principles of the psychological contract.

Fourth, the study questioned the extent to which certain variables, SACPC and GLD, respectively, predicted OPSUD.

It was found that the six variables together explained approximately 49% of the total variance in the levels of teachers' compliance with the psychological contract. The fact that the relevant variables significantly predicted LPSUD shows that individual perceptions of psychological contracts may be moderately affected by these variables. Therefore, the findings obtained from this study are moderately supported by the theoretical explanations in the literature. However, the highest predictor of teacher perceptions related to STCPC was found to be teacher perceptions of SACPC. This may be attributed to social exchange theory. According to the findings of a study conducted by Koçak and Burgaz (2017), gender, seniority, educational status, school type, and school staff affected teachers' perceptions of the psychological contract. Research findings by Guest (2004) state that individual variables such as age, gender, education level, seniority, status, and ethnicity play a role in the formation of the psychological contract. It was concluded in this study that the variables of gender, seniority,

branch, and educational status did not affect teachers' psychological contract perceptions. The findings, therefore, do not corroborate each other.

The findings pertaining to the fourth research question revealed that delegation and responsibility, decision-making, knowledge sharing, skills development, and coaching for innovative performance were all intermediate-level predictors. According to the findings of a study by Koçak and Burgaz (2017), the empowering leadership dimensions of coaching for innovative performance and skills development were the highest predictors. These results also do not overlap. Indeed, De Vos, Buyens, and Schalk (2003) state that it is important to provide education and development opportunities for a positive psychological contract. Guest (2006) also stated that skills development via enriching job and career development opportunities creates a positive atmosphere in the psychological contract.

According to findings by Koçak and Burgaz (2017), delegation and responsibility were the least effective components in dictating teacher compliance with the psychological contract. This may be a result of Turkey's centralized education system, which bars teachers from taking authority or responsibility at school. This was confirmed by another study, which showed that the centralized structure of the Turkish National Education System is an obstacle for teachers to take authority and responsibility within the school (Özdemir & Demircioğlu, 2014). Contrary to this finding, in this study, it was concluded that the sub-dimensions of delegation and responsibility and skill development had moderate predictive value.

Koçak and Burgaz (2017) concluded that the decision-making dimension of empowering leadership behaviors does not explain teacher levels of compliance with the psychological contract. In this study, too, decision-making, knowledge sharing, and coaching for innovative performance did not have a significant effect. The autonomy of teachers in their classroom practices is seen as an inherent part of the profession itself, naturally making the teacher the only authorized person in the classroom (Öztürk, 2011).

Conclusion

The perceptions of the teachers regarding their own level of compliance with the psychological contract were higher than their perceptions of the school administrator's level of compliance with the psychological contract. In other words, teachers believed that school administrators had a low level of care for the personal happiness of teachers, ensuring long-term teacher satisfaction, considering how teachers will be affected by decisions, looking out for teachers, appreciating extra efforts, and providing an environment and opportunity to maintain social interactions with colleagues. School administrators rewarded teacher achievements (via written or spoken thank-you notes, certificates of achievement, material and moral rewards) and involved them in the decision-making processes at school (regarding schedules, shifts, free hours, etc.) at a moderate level. On the other hand, school administrators complied with the pscychological contract at a high level in the following situations: in extraordinary cases (such as illness or being late), showing understanding, meeting teacher demands for effective teaching, and organizing activities for professional development, providing opportunities for promotion, providing an environment where teachers can express their ideas freely, informing teachers about matters related to the general functioning of the school, providing the training that teachers need in order to adapt to professional demands and changes in the education system, avoiding favoritism, being clear in expectations, facilitating legally required trainings, providing feedback, giving the necessary financial support for extracurricular activities, sharing their thoughts on issues that closely concern teachers, providing a healthy environment, sharing the reasons for the decisions taken at school, and demonstrating objective communication behaviors.

The general averages of teachers' levels of compliance with the psychological contract were high on the total scale and in all sub-dimensions. Teachers' level of compliance with the "loyalty" sub-dimension was higher than their level of compliance with "effort for institutional development" and "extra performance" behaviors.

When teachers think that school administrators fulfill their psychological contract obligations, they also fulfill their own obligations. The findings of the study show that the level of teacher compliance with the psychological contract was explained to a large extent by the level of compliance of the school administration with the psychological contract. It was concluded that the variables of gender, branch, seniority, educational status, and length of service at the school (except for one group) were not effective on teachers' perceptions of the psychological contract.

Recommendations

The following recommendations may be made based on the results obtained in the study: School administrators may be given in-service training in supporting the personal happiness of teachers, ensuring continued teacher satisfaction in the long term, gaining empathic thinking skills, increasing teacher commitment to the school, rewarding personal and professional efforts, and ensuring reward justice. On the other hand, in order to increase their efforts for institutional development and extra performance, in-service training can be given to teachers by making plans and conducting needs analyses at the district, provincial, and central levels. In order to provide professional development for teachers, to support them, to help them develop their skills, and to provide coaching for innovative performance and knowledge sharing, seminars can be given to ensure the personal and professional development of administrators to display empowering leadership behaviors, and they can be directed to graduate programs. They may also be encouraged to participate in new activities and projects.

The limitations of the research are as follows: The research covers only one province in Turkey. Including data from other regions will provide a more comprehensive picture of the impact of school administrators' empowering leadership behaviors on teacher perceptions. Second, it does not explain in detail the specific behaviors of school administrators that are perceived as empowering. Therefore, qualitative research can be done. Third, only the perceptions of teachers were investigated, not their actual behavior. Research can be conducted to provide data on how school administrators' behaviors affect teachers' professional performance and satisfaction.

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Auther (s) Conribution Rate
All authors contributed equally to the study.

Conflicts of Interest
There is no disagreement between the authors regarding the study.

Ethical Approval
Since the data of this research were collected before 2020, ethical approval was not obtained. However legal permission was obtained from the Ministry of National Education to conduct the study.

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Latent trajectories of subjective well-being: An application of Latent Growth Curve and Latent Class Growth Modeling

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Latent Trajectories of Subjective Well-Being: An Application of Latent Growth Curve and Latent Class Growth Modeling**

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Abstract

This study proposed a three-stage measurement model utilizing the Latent Growth Curve Modeling and Latent Class Growth Analysis. The measurement model was illustrated using repeated data collected through a four-week prospective study tracking the subjective well-being of volunteer college students (n=154). Firstly, several unconditional growth models were estimated to define the model, providing a better representation of individual growth trajectories. Secondly, several conditional growth models were formulated to test the usefulness of covariate variables hypothesized to explain observed variance in growth factors. Finally, latent class growth models were estimated to further explore different latent trajectory classes. Results showed that students' subjective well-being changed over time, and the rate of this change and its covariates were not constant for the entire sample. This study clearly illustrates how a longitudinal measurement approach can enhance the scope of findings and the depth of inferences when repeated measurements are available.

Keywords: Longitudinal, Individual differences, Latent growth curve modeling, Latent growth classes, Measurement design

Introduction

The most fundamental issue of educational research is determining how individuals' development occurs over time (Aşkar & Yurdugül, 2009). The development process has a multidimensional structure encompassing people's cognitive, affective, and psychomotor skills. Changes in these skills due to various causes result in various outcomes. Hence, one of the ultimate goals pursued by methodological studies in the educational sciences is to uncover general principles for measuring or monitoring the complex structure of individual development (Curran & Wirth, 2004). Repeated observations from longitudinal measurement design, including the time effect, are needed to analyze the change. The reason behind designing the research design as longitudinal rather than cross-sectional is the notion that measurements taken to cover a process can capture the structure of the feature in a more realistic way. In other words, if the structural change over time is theoretically supported, the practical significance of the results can be increased by supporting the measurements and statistical methods used with a longitudinal approach (Kane, 2013). A longitudinal measurement design provides essential information about intra-individual differences, inter-individual differences, and the sources of these differences (Duncan & Duncan, 2009).

Longitudinal research integrates three elements: a theoretical model of the structure, a measurement design that offers a distinct and comprehensive observation of the change process, and statistical models for data analysis (Collins, 2006). The interaction between theory, measurement design, statistical model, and the conclusions drawn from results to add to theory is a never-ending loop (Curran & Willoughby, 2003). Longitudinal research incorporating these three elements will provide an in-depth look at the complexities of individual development. This study focuses on examining intra-individual changes and inter-individual differences in scenarios where the construct is dynamic. The contributions of longitudinal measurement and statistical methods are provided through an example.

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It is necessary to analyze the data using appropriate statistical models to answer the research questions correctly (Hertzog & Nesselroade, 2003). Longitudinal statistical models significantly impact the combination of repeated measures, the analysis of change process hypotheses, and the validity of interpretations drawn from the conclusions. In recent studies, growth modeling has increased researchers' interest in analyzing the differences between change patterns and observation units over time. However, the educational sciences literature has limited application of growth modeling. In the present study, Latent Growth Curve Modeling (LGCM) (Meredith & Tisak, 1990) and Latent Class Growth Analysis (LCGA) (Nagin, 1999), constructed by merging growth model analysis with covariance analysis, were used to model individual growth trajectories.

The Framework of Latent Variable Models

LGCM and LCGA are classified as Latent Variable Models (LVMs) (Muthén, 2007). Within the theoretical framework of LVMs, Table 1 displays the statistical models classified according to the kind of latent variable and whether the research is cross-sectional or longitudinal. Quantitative changes can be explored when the latent variable is continuous (Ruscio & Ruscio, 2008). Factor Analysis can be used as a cross-sectional model, and LGCM can be used as a longitudinal model for examining quantitative changes. Qualitative differences can be investigated when the latent variable is categorical. Some latent variables are hybrid, with both continuous and categorical individual differences. In longitudinal models, LCGA and Growth Mixture Modeling (GMM) (Muthén & Shedden, 1999) are employed when the latent variable is categorical or hybrid.

Table 1. Latent variable models

	Latent Variables		
	Continuous	**Categorical**	**Hybrid**
Cross-sectional	Factor analysis	Latent class analysis	Factor mixture analysis
Longitudinal	Latent growth curve modeling	Latent class growth analysis	Growth mixture analysis

LGCM assumes that individuals come from a unique population and that an average growth trajectory can sufficiently estimate the population's growth. Also, it is assumed that covariate variables influence individuals similarly. However, the average growth trajectory alone is insufficient if the population of growth patterns contains subgroups, and the covariate variables affect these subgroups in various ways. While LGCM allows for the testing of subgroups in the context of observed group membership, such as gender and ethnicity (Curran & Wirth, 2004), it falls short of defining unobserved latent growth groups (Wang & Bodner, 2007). Unlike LGCM, GMM and its special type, LCGA, focus on characterizing unobserved heterogeneity (latent classes) in the population and classifying individuals with similar growth patterns (Jung & Wickrama, 2008).

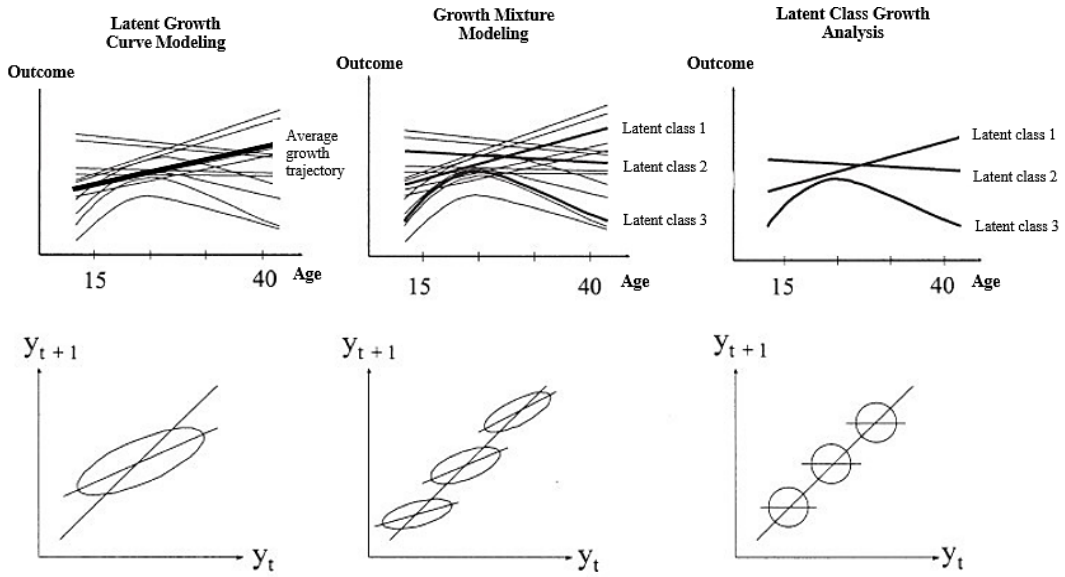


Figure 1. Growth modeling diagrams

Figure 1 illustrates the three major growth modeling approaches (Muthén, 2007). The growth is defined with continuous latent variables in LGCM, whereas the growth is defined with continuous and categorical latent variables in GMM and LCGA (Berlin et al., 2014). GMM allows the differentiation of growth trajectories among the latent classes and individual differences within each class (Jung & Wickrama, 2008). In LCGA, the variance and covariance values of the growth factors in each class are supposed to be constrained to zero and allowed to vary only across classes (Berlin et al., 2014; Nagin, 1999).

According to a study by Nylund et al. (2007), combining LGCM and LCGA will contribute to more in-depth studies and expand the validity and reliability of interpretations. LGCM and LCGA are commonly used to analyze changes in academic achievement (Bilir et al., 2008; Gottfried et al., 2016), health sciences (Aili et al., 2021), and sports sciences (Kim et al., 2016). The change in mental health throughout the COVID-19 pandemic was also investigated using longitudinal statistical models (Pierce et al., 2021). The purpose of the current study is to propose a longitudinal measurement method for describing the properties of individual growth trajectories. This method has been illustrated using data from a repeated four-week study on subjective well-being. The following research questions were examined:

(1) What is the shape of the average growth trajectory in the sample?
(2) When time-varying covariates are incorporated into the growth model, how do model comparisons provide results?
(3) How many latent classes best represent individual growth patterns?

Method

Research Design

This study was developed as a longitudinal panel design (Menard, 2008) with repeated measurements. The same settings and participants are included at each measurement time in this design, also known as cohort studies. Cohort studies can be prospective or retrospective. Prospective studies are carried out from the present into the future. This is a prospective cohort study.

Sample and Data Collection

It is necessary for the participants to be available and cooperative throughout the period to avoid data loss in longitudinal research. The observations of 154 university students who volunteered to complete the survey are included in the data gathered through repeated measures between the 2018 and 2020 academic years. Participants consisted of 76% female students and 17% male students.

The minimal requirement for longitudinal statistical models is that they must be measured at least three equal or irregular intervals. The measurement time points should be sensitive enough to identify the change meaningfully (Ployhart & Vanderberg, 2010). Collecting additional observations leads to higher precision for estimating the individual growth trajectory and greater reliability for measuring change (Willett & Sayer, 1994). Participants were asked to provide observations repeated every week at four equally spaced time points before the midterm exams in the 2018-2020 academic year. Time is coded as 0, 1, 2, and 3 in modeling a linear growth trajectory with four repeated observations. T_0 represents the initial time point; T_1 is the second; T_2 is the third; and T_3 is the fourth. The researcher administered online surveys to gather data from students.

Measures

The data comes from a more extensive longitudinal study asking how participants spent the previous week concerning various positive and negative affective factors. Participants were asked to rate these items on a 5-point Likert-type scale (1 = never to 5 = very often). Observed indicators such as happiness, peace, satisfaction, and energy were employed to measure the subjective well-being construct. Confirmatory Factor Analysis (CFA) was used to examine factor structures of subjective well-being over time. CFA results are given in Table 2.

Table 2. Results of the CFA for subjective well-being across measurement time points

	Measurement Time Points			
	Time 1 (T_0)	**Time 2 (T_1)**	**Time 3 (T_2)**	**Time 4 (T_3)**
AIC	2455.21	2397.86	2580.33	2462.39
BIC	2497.65	2440.31	2622.78	2504.83
CFI	1.00	0.98	0.98	0.99
TLI	1.00	0.96	0.94	0.98
RMSEA	0.00	0.10	0.10	0.10
SRMR	0.006	0.01	0.026	0.014
Cronbach α	0.87	0.89	0.87	0.89
McDonald ω	0.91	0.90	0.88	0.91

Table 2 shows that the CFA results confirmed the single-factor structure of subjective well-being across four-time points. Reliability coefficients of four-time points were between 0.87 and 0.89 for Cronbach's α and between 0.88 and 0.91 for McDonald's ω. The McDonald's ω coefficient is computed for composite total score reliability. Subjective well-being scores were calculated based on the total scores of the observed indicators. The total subjective well-being scores range from 4 to 20. Some variables, including sleep quality, resilience, and stress, were selected as covariate variables. Resilience and stress items are rated on a 5-point Likert-type scale (1 = never to 5 = very often), and sleep quality scores range from 5 to 20.

Data Analysis

Participants with missing values at any time point were excluded from the analysis. The descriptive statistics indicated a declining trend in the mean subjective well-being over the weeks ($X_{T0} = 11.9$; $X_{T1} = 10.9$; $X_{T2} = 10.2$; $X_{T3} = 10.0$). It is suggested that for a better estimation of LGCM, the slope parameter must have adequate variance (Lorenz et al., 2004). Pearson product-moment correlations were calculated to evaluate the variance of the slope parameter. The correlations between four-time points showed that the first and second-time points ($r = 0.50$, $p < 0.01$) had a stronger relationship than the first and third-time points ($r = 0.30$, $p < 0.01$). This correlation means that later measures have progressively lower correlations with earlier measures as a function of increasing time. This result suggests that the rate of change over time varies and there is an inter-individual variance in the rate of change.

Latent Growth Curve Modeling

LGCM consists of two parts: a measurement model and a structural model. The measurement model refers to the intra-individual level. The measurement model part is:

$$y_{it} = \eta_{0i} + \eta_{1i}a_t + \eta_{2i}a^2_t + \varepsilon_{it} \quad (1)$$

where y_{it} is the observed outcome measure of participant i at the time point t; η_{0i}, $\eta_{1i,}$ and η_{2i} are the intercept, linear slope, and quadratic slope, respectively, for participant i; ε_{it} is the error score for participant i; and a_t is the associated time score. Time scores are coded 0 for the initial time point, so the slope is interpreted as the rate of change, and the intercept is interpreted as the mean score at the initial time point. The intercept and slope parameters are growth factors in the model. The quadratic slope will be removed from the model if it is not statistically significant. The structural model parts are:

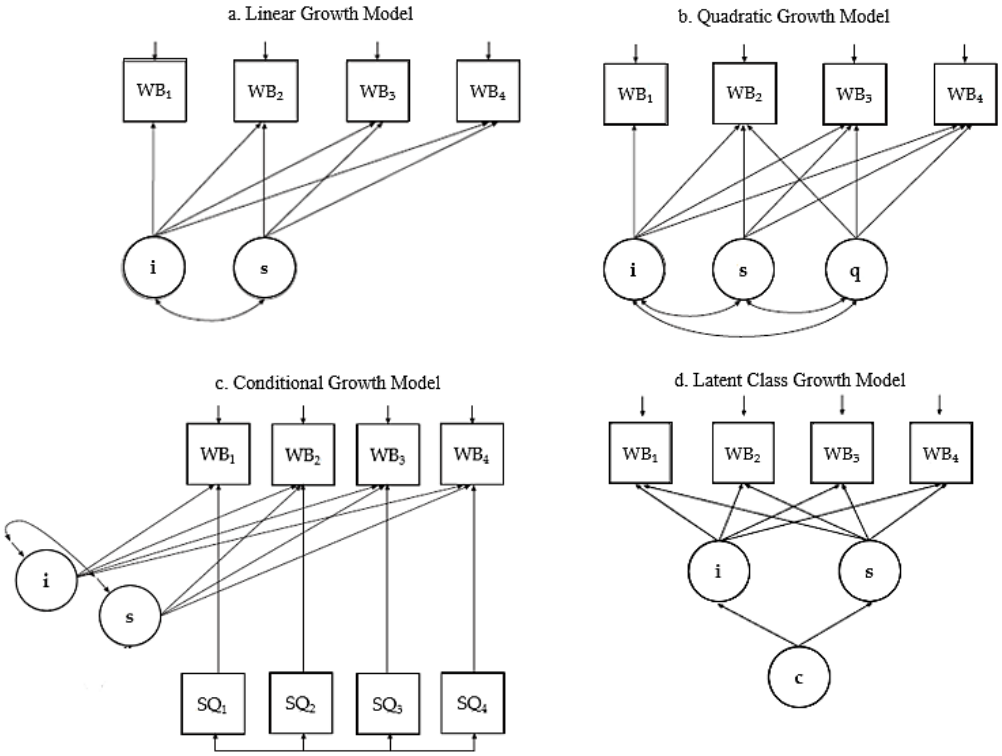
$$\begin{aligned} \eta_{0i} &= \beta_{00} + \beta_{01}x_i + \zeta_{0i} \\ \eta_{1i} &= \beta_{10} + \beta_{11}x_i + \zeta_{1i} \\ \eta_{2i} &= \beta_{20} + \beta_{21}x_i + \zeta_{2i} \end{aligned} \quad (2)$$

where $\beta_{00,}$ $\beta_{10,}$ and β_{20} are the mean intercept, the mean linear slope, and the mean quadratic slope, respectively, and $\beta_{01,}$ $\beta_{11,}$ and β_{21} are the variance for growth parameters, respectively. ζ_{0i}, $\zeta_{1i,}$ and ζ_{2i} are their error terms. Unconditional models such as linear (Model 0) and quadratic (Model I) were fitted to the data to examine the shape of growth trajectories (see Figures 2a and b).

The conditional model (see Figure 2c) was fitted to the data to explain the variation among participants in growth factors (Byrne et al., 2008). The measurement model with sleep quality (SQ) as a time-varying covariate is in Equation 3:

$$y_{it} = (\eta_{0i} + \eta_{1i}a_t) + (\gamma_t * SQ_{it}) + \varepsilon_{it} \quad (3)$$

where γ_t is the coefficient of the covariate effects on growth factors; in this case, y_{it} is the sum of the errors and the covariate effect. Sleep quality (Model II), resilience (Model III), and stress (Model IV) were added to the conditional model as time-varying covariates, respectively.



Note. i - intercept, s - slope, q - quadratic slope, c - categorical latent class, WB - subjective well-being, SQ – sleep quality

Figure. 2. Path diagrams for four types of Growth Modeling

The unconditional and conditional LGCMs were fitted to the data using M*plus* 7 (L. Muthén & Muthén, 1998-2012). All models were estimated using the maximum likelihood (ML) estimation. The comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were considered to evaluate the model-data fit. The recommended cutoffs of CFI>0.95, RMSEA<0.05, and SRMR<0.05 as indicating a good model fit and CFI>0.90, RMSEA<0.08, and SRMR<0.08 as indicating an acceptable model fit were used (Brown, 2015; Hu & Bentler, 1999). The log-likelihood difference test (T_D) was utilized to compare nested models (B. Muthén & Muthén, 2020).

Latent Class Growth Analysis

Figure 2d demonstrates an unconditional LCGA model. The measurement model part is like an unconditional LGCM,

$$y_{it}|(C_i = c) = \eta_{0i} + \eta_{1i}a_t + \varepsilon_{it} \quad (4)$$

where y_{it} is the observed score of participant *i* at time point *t*. y_{it} is conditional on the class membership C_i. a_t is the time score, η_{0i} and η_{1i} are the intercept and slope, and ε_{it} is the error score for participant *i* in class *c*. The structural models are like unconditional LGCM, but it includes the categorical latent class variable *c*, which apprehends the heterogeneity in the population (Nylund et al., 2007). The structural model part as

$$\eta_{0i} = \beta_{c00} + \zeta_{c0i}$$
$$\eta_{1i} = \beta_{c10} + \zeta_{c1i} \quad (5)$$

where β_{c00} is the mean intercept and β_{c10} is the mean slope within class *c*. ζ_{c0i} and ζ_{c1i} are error scores for participant *i* in class *c*. In LCGA, all individual latent trajectories within classes are assumed to be homogeneous and permitted to vary only among classes (Nagin, 1999). The LCGA model was evaluated by a sequentially increasing number of latent classes (one-, two-, and three-class) to determine the class formation. The ML approach was employed to estimate the model.

One of the most challenging LCGA tasks is properly characterizing the latent class number. Suppose the researcher has no prior information about the latent class number in the data. In that case, the most frequent method is to analyze models with different class numbers and compare model-fit indices (Tofighi & Enders, 2007). Firstly, it is recommended to carefully check the estimation output, looking for outlier parameter estimates and other problems (Ram & Grimm, 2009). Secondly, models can be evaluated by comparing *information criteria indices* such as Akaike Information Criterion (AIC) (Akaike, 1987), Bayesian Information Criterion (BIC) (Schwarz, 1978), and Sample Size Adjusted BIC information criteria (SSA-BIC) (Sclove, 1987). Lower values indicate better-fitting models. Thirdly, nested models can be compared according to likelihood ratio tests (LRTs) that compare models with *c* and *c-1* latent classes. The LRTs are the adjusted Lo-Mendell-Rubin LRT (LMR-LRT), Vuong-Lo-Mendell-Rubin LRT (VLMR-LRT) (Lo et al., 2001), and the parametric Bootstrap LRT (BLRT) (McLachlan & Peel, 2000). A significance test ($p < 0.05$) of the VLMR-LRT or LMR-LRT points out that the model with the *c–1* class should be rejected in favor of the model with the *c* classes (Nylund et al., 2007). Finally, models can be evaluated concerning the accuracy with which individuals have been appointed as belonging to one group. Entropy indicates the degree of classification uncertainty. It ranges from 0.00 to 1.00, high values (>0.80) suggest that individuals are classified as reliable and that there is sufficient separation among classes (Collins & Lanza, 2010). Average posterior probability (APP) values are generated by averaging the class probabilities of individuals with the highest posterior probability. When the APP value exceeds 0.70, individuals in a latent class have similar growth patterns (Nagin, 1999).

Results

Results of Research Question I

Unconditional LGCMs such as Model 0 (linear) and Model I (quadratic) were specified to predict the mean and the variance of growth factors across individuals. Table 3 summarizes unconditional model fit indices. The model-data fit indices indicate an inadequate fit of Model 0 to the data ($\chi^2 = 17.87(5)$, $p > 0.05$; CFI = 0.86, TLI = 0.84, SRMR = 0.06 and RMSEA = 0.13). The model-data fit indices indicate an adequate fit of Model I (CFI = 1.00, TLI = 1.00, SRMR = 0.005, and RMSEA = 0.00). Because of the fully saturated model, model fit indices always provide a perfect fit to the data. According to nested model comparisons, the log-likelihood difference test revealed a non-significant difference between these two unconditional models ($T_D = 17.21(4)$, $p > 0.01$). However, because Model 0 is more parsimonious than Model I, it was determined to be the best-fitting model, and it was concluded that students showed a linear growth pattern in subjective well-being.

Table 3. Model fit indices for unconditional LGCMs

	$\chi^2(df)$	AIC	BIC	RMSEA	SRMR	CFI	TLI	T_D
Model 0	17.87 (5)	3300.94	3328.28	0.13	0.06	0.86	0.84	-
Model I	0.79 (1)	3291.15	3330.63	0.00	0.005	1.00	1.00	17.21 (4)

The mean intercept and slope estimates were 11.49 and -0.21, respectively ($p < 0.05$). The average subjective well-being at the initial time was approximately 11.49, and the weekly decrease in values was approximately -0.21 points on average. The estimate of variance intercept was 6.74, indicating inter-individual differences in the initial time point ($p < 0.05$). The estimate of variance slope was 0.81, indicating inter-individual differences in growth rate ($p < 0.05$).

Results of Research Question II

Sleep quality (Model II), resilience (Model III), and stress (Model IV) variables as time-varying covariates were cumulatively added to the unconditional linear growth model. In conditional LGCMs, the slope growth factor is defined as a function of the intercept factor, controlling for covariates. Table 4 summarizes model fit indices.

Table 4. Model fit indices for conditional LGCMs

	$\chi^2(df)$	AIC	BIC	RMSEA	SRMR	CFI	TLI	T_D
Model 0	17.87 (5)	3300.94	3328.28	0.13	0.06	0.86	0.84	-
Model II	42.41 (17)	3221.04	3260.44	0.10	0.06	0.87	0.84	78.34(4)*
Model III	45.32 (29)	2999.89	3051.41	0.06	0.04	0.96	0.94	139.30(4)*
Model IV	43.64 (41)	2833.77	2897.41	0.03	0.03	0.98	0.98	177.60(4)*

* $p < 0.05$

Considering conditional LGCMs fit indices, Model IV fitted the data better than the previous ones after controlling time-varying covariates' effects (sleep quality, resilience, and stress). The log-likelihood difference test for nested models revealed significant differences between these conditional models ($p < 0.05$). This means that adding to covariates improved step-by-step model fits. In Model IV, the CFI and TLI were reported to be 0.98 better in magnitude than in Model 0. The RMSEA and SRMR were enhanced to an acceptable level of 0.03. Model IV had the lowest AIC and BIC values, indicating a better model-data fit. The observed mean value, unconditional (Model 0), and conditional (Model IV) mean estimate values were plotted in Figure 3. Model IV appeared to be the model that best captured the change in the data.

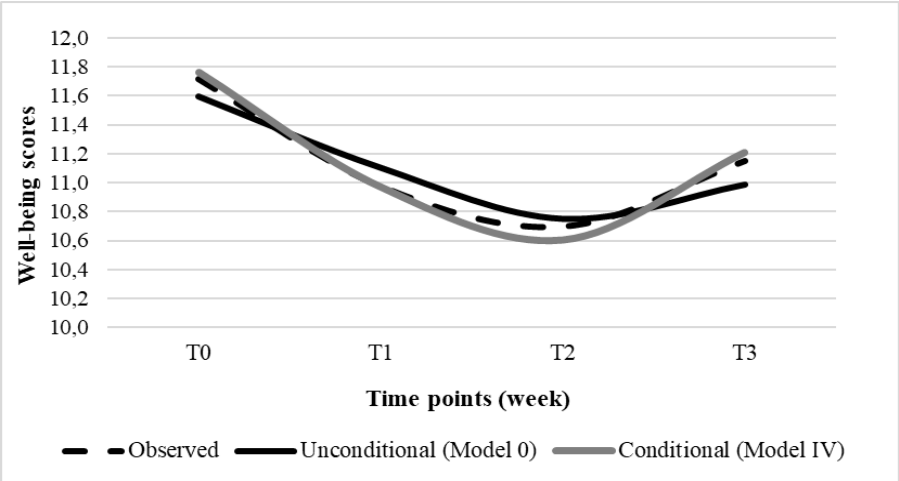


Figure. 3. The plot of observed mean value, unconditional and conditional LGCMs mean estimates

Table 5 summarizes conditional model estimates. The rate of change decreased, and this decrease occurred faster (slope values for Model 0 and Model IV were -0.21 and -1.22, respectively). The growth parameters' standard error estimates were reduced compared to the unconditional model. The conditional model results showed that covariates significantly affected subjective well-being scores at every time point ($p < 0.05$). The mean intercept and mean slope estimates were 13.2 and -1.22, respectively, controlling for covariates. The intercept and slope variance became 2.66 and 0.36, respectively, in contrast to 6.74 and 0.81, in the unconditional model. There is a decline of 60% in intercept variance and 55% in slope variance explained by the covariates.

Table 5. Parameter estimations from the unconditional and conditional LGCMs

Parameters	**Estimate**	**Estimate/SE**
Unconditional Model (Model 0)		
Mean intercept (β_{00})	11.5*	41.27
Variance of intercept (β_{01})	6.74*	4.16
Mean slope (β_{10})	-0.20*	-1.96
Variance of slope (β_{11})	0.81*	2.62
Conditional Model (Model IV)		
Mean intercept (β_{00})	13.2*	15.84
Variance of intercept (β_{01})	2.66*	3.78
Mean slope (β_{10})	-1.22*	-2.85
Variance of slope (β_{11})	0.36*	2.30

* $p < 0.05$

Results of Research Question III

The LCGA model fit by consecutively increasing the number of latent classes (from one to three) was evaluated to determine the latent growth trajectory classes. The results increasingly presented better (i.e., smaller) AICs, BICs, and SSA-BICs (Table 6).

Table 6. Model fit criteria for class formation for LCGA

Model-Fit Indexes	LC1	LC2	LC3
AIC	3388.22	3327.56	3310.24
BIC	3406.45	3354.89	3346.69
SSA-BIC	3387.45	3326.40	3308.71
Entropy	-	0.76	0.79
LMR-LRT *p*	-	0.05*	0.07
VLMR *p*	-	0.05*	0.06
BLRT *p*	-	0.00*	0.00*

*$p < 0.05$; LC = latent class

Table 6 shows that comparing the current model against the model with one less class than the current model of choice should give an LMR-LRT *p*-value that is significant ($p < 0.05$). The LMR-LRT indicated that the data fit with the two-class model was not improved with the three-class model. The BLRT showed a statistically significant difference between the two-class versus the three-class models. The VLMR showed a non-significant difference between the two-class versus three-class models. The number of latent classes is subject to the model fit indices, the research question, parsimony, and interpretability. Hence, the two-class model was determined to be the best-fit model.

An entropy value summarizes individual class probabilities to evaluate classification quality. The entropy value of 0.76 showed good quality in classifying students into the two classes. The APP values were all reasonably high (0.85 or higher), near 1.0. Together, latent class findings recommend a good model fit for the two-class model. The estimated means of each class based on posterior probabilities are presented in Figure 4. This plot indicates that the sample shows heterogeneous growth in subjective well-being and that the amount of change does not occur similarly for the entire sample.

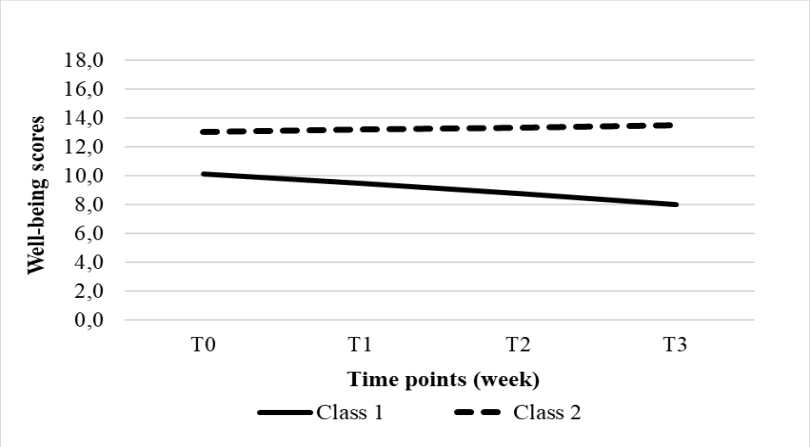


Figure 4. Estimated means of latent classes.

According to the growth patterns, Class 1 (55%) was the largest class. Class 1 members began with an average score of 10.13 at the initial time point and decreased by -0.81 points over time ($p < 0.05$). Members of Class 2 (45%) began with an average 13.03 score at the initial time point and increased by 0.16 points over time ($p < 0.05$). While the unconditional LGCM indicated a decreasing trend over time, this decline appeared limited to Class 1. This result suggests the existence of unobserved heterogeneity in the sample.

Discussion

The present study examined the latent growth trajectories of subjective well-being over time using a person-centered longitudinal measurement method. In the first stage, the unconditional LGCM demonstrated that the average growth trajectory was a linear decline over time with inter-individual differences at the initial time point. It is in line with previous studies that supported the linear growth of subjective well-being (Diener et al., 2018). In the second stage, adding the covariates to the unconditional model improved the model-data fit, and growth trajectories were much steeper than in the unconditional model. The results supported the hypothesis that changes in covariates influence changes in subjective well-being. It has been empirically supported that the contribution of the longitudinal measurement methods in concurrently modeling the time-varying covariates and observed variables (Wickrama et al., 1997).

It is quite possible that differentiation of latent trajectories exists within the larger population in educational research (Jung & Wickrama, 2008). The sources of this heterogeneity can be groups as observed or unobserved groups. In the third stage, the presence of unobserved distinct growth trajectories was explored with the LCGA model. Based on parsimony and interpretability, the two-class model was chosen as the best model to explain the heterogeneity of growth trajectories. One of the latent trajectory classes (Class 1) displayed similar growth trajectories with the unconditional model, but the slope was much smoother. The second latent trajectory class (Class 2), unlike Class 1, displayed an increasing trend over time. The results demonstrated that subjective well-being changed over time, and the rate of this change, as well as its covariates, were not constant for the entire sample. Consistent with previous studies, the results revealed that subjective well-being had a dynamic structure and supported the importance of using longitudinal measurement methods to explore the change process (Fernandez-Rio et al., 2021). The results highlighted the need to examine the growth process longitudinally rather than cross-sectionally and identify unobserved heterogeneity within the population (Muthén & Brown, 2009).

The correspondence between construct and measurement design must be required for making proper and valid inferences from the data (Cronbach & Meehl, 1955). Longitudinal studies can support us in understanding transitions in people's lives, interruptions, trauma, and turning points that might contribute to comprehension (Goswami et al., 2016). In this regard, longitudinal data are necessary for constructs that are open to change by nature, such as depression (Barboza, 2020), mental development (Lee, 2020), and language development (Elahi-Shirvan et al., 2021) to analyze and understand the growth over time and answer questions about how they relate to other important competencies. The Latent Transition Model (Collins & Wugalter, 1992) and Latent State-Trait Models (Cole, 2012) can also be used to model longitudinal growth patterns.

Conclusion

The current study utilized a person-centered longitudinal measurement model to examine subjective well-being growth trajectories. The results revealed that subjective well-being showed inter-individual and intra-individual variation over time, and the rate of these changes, as well as its covariates, differed among individuals. Longitudinal research has revealed several statistical methodologies in which the origins of intra-individual and inter-individual variation must be considered jointly. The longitudinal statistical approaches employed in this study differ from others in two ways: they combine mean and covariance structures and allow measurement error to be evaluated and modeled simultaneously (Byrne et al., 2008). By controlling for the effect of diverse sources of variability on subjective well-being, inter-individual differences in latent growth patterns and intra-individual change were explored in detail. The categorical latent class variable was used to model the sample heterogeneity in the latent class growth analysis. Several research studies have stressed the importance of considering the heterogeneity within the sample while studying inter-individual variation in a longitudinal pattern (Wang & Bodner, 2007). Even a small percentage of a group with distinct features in the sample can suppress the variation pattern for the entire sample and obscure alternate development curves (Muthén, 2002). Ignoring the characteristics of latent classes with various developmental patterns can hide the dynamic interactions that lead to significant outcomes (Connell & Frye, 2006). The results highlighted the importance of examining continuous and cumulative processes longitudinally and evaluating latent classes based on the possibility of a heterogeneous distribution within the sample (Muthén & Brown, 2009).

Limitations

The current study includes several limitations due to its illustrative nature. Firstly, the sample consisted of student volunteers, with missing data excluded from the study. This restriction was performed to keep the study

simple and parsimonious. It is stressed that a larger sample size is required in longitudinal studies to more precisely model estimations (Diallo et al., 2017); however, in recent years, robust estimation methods have been established for proper model estimations with small sample sizes (Shi et al., 2021). A cross-validation study is recommended with different sample sizes and the inclusion of students with missing data. Additionally, the majority of the sample consisted of female students, mainly due to their voluntary participation. Therefore, it is recommended to include a more diverse group to obtain more accurate estimation results. Secondly, four weekly repeated measures were used to model growth trajectories. It can be investigated how different time intervals, such as daily or weekly, affect intra- and inter-individual changes. Thirdly, subjective well-being was operationalized using observed indicators such as happiness, peace, satisfaction, and energy. Moreover, a limited number of available covariates were used to predict the model. The effects of different covariates can be tested to define the growth process properly. The effect size of the covariates can be investigated in future studies using various methods (Feingold, 2021; Li & Harring, 2017). Finally, since the later measures have progressively lower correlations with the earlier measures as a function of increasing time, the effects of covariates were modeled with indicators concurrently. The Autoregressive Latent Trajectory Model (Bollen & Curran, 2004; Scott, 2021) can also be used to define the growth trajectories in longitudinal data. This model has one thing in common with the autoregressive model; the ability to include knowledge of the past values of a variable to estimate current values, which allows us to model growth trajectories with lagged influences (cross-lagged = 1, 2,..).

Recommendations

In this study, LCGA approaches were used to define latent trajectory classes. These models assume that no inter-individual differences are fixed to zero, meaning all individuals in a given latent class are similar. GMM can be used to explore latent classes if the variance of growth factors is statistically significant, and the sample size is sufficient for within-class variance estimation. External variables (covariates or distal outcomes) can be added in various ways to the model (Bakk & Kuha, 2020). The present study did not investigate the effect of covariates on latent class formation. Covariate variables can be utilized to explain the class membership and the class assignment information can be used as a predictor for the distal outcome for further analyses. It is suggested that longitudinal measurement methods be utilized for more reliable and valid inferences from measurements in educational and psychological sciences, where individual development is more essential (Fukkink & van Verseveld, 2020).

Author (s) Contribution Rate

First author: Conceptualization, design, data acquisition, data analysis and interpretation, writing, drafting manuscript.
Second author: Editing and reviewing, supervision, critical revision of the manuscript, final approval.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Approval

Ethical permission (2018/75228) was obtained from Gazi University Ethical Committee institution for this research.

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The Mediating Role of Dark Triad Personality Traits in the Relationship Between Childhood Traumas and Obsessive Beliefs

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The Mediating Role of Dark Triad Personality Traits in the Relationship between Childhood Traumas and Obsessive Beliefs

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Abstract

This study aims to investigate the relationship between childhood traumas, dark triad personality traits, and obsessive beliefs. Personal Information Form, Childhood Trauma Questionnaire, Short Dark Triad Scale, and Obsessive Beliefs Questionnaire were used to collect data in the study. A total of 480 volunteers, of which 306 were female and 174 were male, participated in the study. Pearson Correlation Analysis, independent samples t-test, and Parallel Multiple Mediator Variable analysis were used for the analysis of the obtained data. The correlation analysis results showed that childhood traumas were significantly and positively associated with both dark triad personality traits and obsessive beliefs. Male participants' psychopathic personality traits mean scores were found to be significantly higher than those of females. Mediation analysis results show that the psychopathic personality traits had a mediating effect on the relationship between the physical and emotional neglect and abuse sub-dimensions of childhood traumas and obsessive beliefs. The findings were discussed vis-à-vis the available relevant literature and suggestions were presented.

Keywords: Childhood traumas, Dark triad personality Traits, Obsessive beliefs

Introduction

Some daily life events can have diverse effects on an individual's current state and future prospects. Traumas, which instill extreme fear and helplessness, often result from such extraordinary and unforeseen occurrences in daily life (Aker & Önder, 2003). Trauma is the outcome experienced or witnessed by an individual in the face of death, a threat of death, severe injury, or a violation of bodily integrity. Examples of traumatic events include sexual abuse, physical abuse, domestic violence, community and school violence, medical trauma, traffic accidents, terrorist attacks, warfare, natural and man-made disasters, suicides, and other traumatic losses (Regier et al., 2013). Traumas can impact individuals' physical, mental, and spiritual well-being, as well as their daily lives, in various ways. While some individuals develop trauma following such adverse experiences, others may not be affected to the same degree. Trauma does not necessarily result in negative consequences for all individuals. Numerous factors, such as personality traits, socio-cultural structures, poverty, family relationships, and social support, are believed to influence individuals' reactions to trauma (Laporte et al., 2011; Linley & Joseph, 2004; Yener, 2017).

Childhood is a critical period for shaping individuals' biological, cognitive, and socio-emotional characteristics. In addition to physical development, this phase lays the foundation for psychosocial capabilities, personality, and future adolescent and adult life (Lally & Valentine-French, 2019). Therefore, childhood traumas may significantly influence children's developmental trajectory and have long-term effects throughout their lives (Acehan et al., 2013; Ford, 2016). Common causes of childhood traumas include sexual, physical, and emotional abuse, neglect experienced before the age of eighteen, parental loss, adverse life experiences such as separation from parents, parental divorce, witnessing domestic violence, migration, accidents, and natural disasters (Herman, 2015). Child abuse or neglect, which is a prominent factor contributing to childhood trauma, is described by relevant professionals as the inappropriate or harmful treatment of a child by an adult, such as a parent or caregiver, deviating from social norms and impeding the child's development while causing physical, mental, sexual, or social harm and endangering the child's health and safety (Oral et al., 2001).

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Dimensions of Neglect and Abuse

The World Report on Violence and Health outlines four types of child maltreatment: physical abuse, sexual abuse, emotional and psychological abuse, and neglect (WHO, 2006). Physical abuse encompasses behaviors such as injuring, choking, or kicking where intentional physical force is directed at a child, resulting in harm, injury, and detriment to the child's well-being, life, development, or dignity. Sexual abuse involves subjecting a child to sexual activities, such as exhibitionism, voyeurism, or witnessing sexual intercourse, that the child does not fully comprehend, cannot provide informed consent to, or is not developmentally prepared for, and that violate societal laws or social taboos (WHO, 2006; Pala et al., 2011). Emotional child abuse refers to a pattern of behavior in which a child is deprived of the attention, love, and care they need, resulting in psychological harm. Abusive behaviors include but are not limited to confining the child to a room, intimidation, isolation, yelling, and adopting an overprotective attitude (Acehan et al., 2013; Güler et al., 2002). Neglect is defined as an ongoing failure to fulfill a child's basic needs, including nutrition, clothing, shelter, education, medical care, social interaction, and love. It involves a lack of necessary attention to the child's living conditions and encompasses physical, emotional, and social neglect. Neglectful behaviors can manifest in not providing proper care, not ensuring a safe environment, and failing to meet the child's emotional and social needs (Grummitt et al., 2021).

Child neglect and abuse are pervasive issues that have detrimental effects on a child's development, leaving lasting psychological scars and leading to tragic outcomes (Briere & Elliott, 2003; De Bellis & Zisk, 2014). Childhood traumas not only disrupt the normal development process but also serve as a catalyst for challenges experienced in adulthood (Kendall-Tackett et al., 1993; Springer et al., 2007). Research conducted by Norman et al. (2012) indicates that childhood traumas can contribute to developmental disorders that persist well into adulthood. These disorders can manifest as psychological and behavioral problems, including disruptions in social interactions, self-harm (Dube et al., 2001), post-traumatic stress disorder (Widom, 1999), depression, and substance abuse (Bostancı et al., 2006; Molnar et al., 2001). Additionally, physical ailments such as obesity (Der Kolk, 2003: 1-30), heart diseases, and high blood pressure (Danese et al., 2009) have been associated with childhood traumas. Furthermore, the literature suggests that individuals with a history of childhood trauma may be more susceptible to experiencing physical, cognitive, behavioral, and psychological problems in later life (Anda et al., 2008; Felitti et al., 1998; Kalmakis & Chandler, 2015; Whitfield et al., 2003). Long-term follow-up studies have revealed that childhood traumas contribute to significant and progressively worsening physical, emotional, social, and behavioral problems and that individuals with childhood traumas are more likely to exhibit various psychopathological behaviors (Corso et al., 2008; Chapman et al., 2004; Gündüz & Gündoğmuş, 2019; Örsel et al., 2011).

Dark Triad Personality Traits

It is claimed that traumas that are exposed can affect individuals emotionally, cognitively, and socially, and that these traumas may also have negative effects on personality development (Allen & Lauterbach, 2007; Z-Page, 2004). In the relevant literature, it has been stated that childhood traumas have disruptive effects on identity and personality development and that negative experiences in childhood may be effective in completing the individual's identity development and causing identity confusion (Güler, 2014). It has also been reported that childhood traumas are associated with personality disorders (antisocial, paranoid, etc.) (Carr & Francis, 2009; Sansone et al., 2004). Childhood traumas (such as physical and emotional abuse) can lead to the individual having maladaptive personality traits (De Carvalho et al., 2015; Spinhoven et al., 2016). A study conducted in Turkey revealed that as childhood traumas increase, creative personality traits decrease (Büyükcebeci, 2019). It has also been found that childhood traumas serve as a risk factor for the development of personality disorders (Ball & Links, 2009; Horesh et al., 2003; Sansone et al., 2004; Yen et al., 2005). All of these findings highlight the significance of the relationship between childhood traumas and personality traits. It has been argued that the personality traits that encompass an individual's feelings, thoughts, and behaviors may also be affected by childhood traumas (Roberts et al., 2006). Therefore, it seems reasonable to explore the relationship between dark triad personality traits and childhood traumas in this study.

The dark triad personality traits, which are variables of interest in this study, encompass non-pathological personality traits consisting of narcissism, machiavellianism, and psychopathy. These traits are characterized as socially unwelcome, unwanted, and offensive (Jonason et al., 2015; Paulhus & Williams, 2002). They are associated with socially undesirable behaviors, self-centeredness, and a lack of pro-social orientations (Rauthmann & Kolar, 2012). These personality traits have been linked to negative behaviors such as aggression,

erratic behavior, socio-emotional deficits, difficulties in interpersonal relationships, and antisocial behavior (Cairncross et al., 2013; Muris et al., 2017; Van Geel et al., 2017).

The Machiavellianism personality trait is characterized by a focus on one's own ambition and interests and adopting a utilitarian perspective in interactions with others. Individuals with this trait are prone to lying for personal gain and engaging in manipulative tactics to achieve success. They tend to disregard ethical values and prefer to cultivate relationships with influential individuals (Fehr et al., 1992). Narcissism, on the other hand, involves an excessively high sense of self-importance. Individuals with this trait exhibit behaviors such as grandiosity, entitlement, arrogance, a lack of empathy, indifference, and egocentrism (Campbell & Foster, 2016; Pailing et al., 2014). Psychopathy constitutes the ultimate component of the dark triad. It encompasses a range of behaviors, including antisocial tendencies, thrill-seeking, a lack of empathy, aggression and impulsivity (Hopley & Brunelle, 2012). Moreover, individuals with psychopathy often exhibit aggressive behaviors and have a propensity for criminal activities (Jakobwitz & Egan, 2006; Muris et al., 2017).

Recently, there has been a significant focus on the concept of the 'Dark Triad', which comprises the personality traits of Machiavellianism, narcissism, and psychopathy. The Dark Triad is believed to capture the darker aspects of human personality and has been extensively investigated in various studies. Existing literature has examined the constituent traits of the Dark Triad in relation to several variables, including impulsivity (Szabó & Jones, 2019), empathy, forgiveness (Giammarco & Vernon, 2014), self-control (Jonason & Tost, 2010), and violence (Pailing et al., 2014). On the other hand, the relevant studies carried out in Türkiye explored various variables such as sensation-seeking behaviors (Satıcı et al., 2019), relational aggression (Karaaslan & Gizir, 2021), job satisfaction, love styles, and attachment (Özsoy & Ardıç, 2017; Uysal, 2016). Studies in the literature have indicated that dark triad personality traits play a mediating role between childhood traumas, emotional abuse, and cyberbullying (Kircaburun et al., 2019). Furthermore, these personality traits have been found to be positively and significantly associated with bullying behaviors (Davis et al., 2022) and violence towards intimate partners (Kiire, 2017).

It is stated that childhood traumas may have negative effects on the development of personality traits that comprise an individual's emotions, thoughts, and behaviors (Roberts et al., 2006). In this context, it is anticipated that significant relationships may exist between childhood traumas and dark triad personality traits. A study also found a higher prevalence of childhood traumas among individuals with dark triad traits (Jia et al., 2020). Therefore, investigating the relationship between maladaptive and socially undesirable dark triad personality traits and childhood traumas is believed to help identify risk factors associated with childhood traumas. It is known that individuals with dark triad traits are prone to manipulative, selfish, lacking empathy, and aggressive behaviors (Paulhus & Williams, 2002). Similarly, childhood traumas have been observed to play a significant role in the development of risky behaviors (Dube et al., 2001). Understanding the relations between these two variables may contribute to the prevention of risky behaviors, reducing the effects of childhood traumas, and developing effective healing methods to manage the personality traits resulting from these traumas.

Obsessive Beliefs

Obsessive beliefs, a key variable in this study, are defined as dysfunctional cognitive biases that lead to intrusive thoughts, impulses, and misinterpretations (Briggs & Price, 2009). These beliefs encompass six distinct domains: 'inflated responsibility'; 'over-importance of thoughts'; 'excessive concern about the importance of controlling one's thoughts'; 'overestimation of threat and intolerance of uncertainty'; and 'perfectionism' (Frost et al., 1997; Konkan et al., 2012). In the existing literature, obsessive beliefs are examined in conjunction with their role in the development and persistence of obsessive and compulsive symptoms (Abramowitz et al., 2006; Barahmand et al., 2014; Briggs & Price, 2009; Tümkaya et al., 2015). Studies investigating the symptoms of Obsessive-Compulsive Disorder and obsessive beliefs have found a strong association between them, suggesting that dysfunctional beliefs play a significant role in the persistence of obsessive and compulsive symptoms (Konkan et al., 2012; Tümkaya et al., 2015). Moreover, research exploring the exclusive link between obsessive beliefs and Obsessive-Compulsive Disorder has revealed that certain obsessive beliefs, such as inflated personal responsibility and the overestimation of threat, are specifically associated with the disorder. However, other domains of obsessive beliefs, such as perfectionism and certainty, may also be relevant to other psychopathologies such as anxiety and depression (Purdon & Clark, 1993; Steketee et al., 2003; Shams & Milosevic, 2015; Tolin et al., 2003; Tolin et al., 2006).

It is known that childhood traumas have been linked not only with obsessive beliefs but also to self-blame, denial, and intrusive, recurrent thoughts (Janoff-Bulman, 1989). Therefore, it has been indicated that childhood traumas may play a role in negative cognitive processes related to obsessive beliefs (Briggs & Price, 2009;

Taylor, 2000). It is stated that childhood traumas can lead to the development of obsessive beliefs. For instance, traumatic experiences during childhood may lay the foundation for obsessive beliefs such as feelings of insecurity, loss of control, and a search for order. Childhood traumas may also influence individuals' thoughts, behaviors, and emotional states, contributing to the emergence of obsessive beliefs (Selvi et al., 2012). Additionally, it is suggested that traumatic experiences in childhood may increase the risk of exhibiting obsessive thoughts and compulsive behaviors in adulthood and may be associated with dysfunctional obsessive beliefs and other psychopathologies such as anxiety and depression (Caspi et al., 2008; Çelikel & Beşiroğlu, 2008; Purdon & Clark, 1993; Semiz et al., 2014). Therefore, investigating the relationship between childhood traumas and obsessive beliefs is expected to contribute to a better understanding of individuals and the development of effective intervention methods. The information obtained regarding this relationship may be used in planning therapy processes and developing coping strategies for dealing with obsessive beliefs.

Based on the comprehensive information provided, it is evident that childhood traumas can have detrimental effects on various aspects of a child's development, including behavioral, social, cognitive, and emotional domains, which can extend into adulthood (Kendall-Tackett, 2002; Springer et al., 2007; Zhang et al., 2020). Therefore, it is crucial to examine and describe the relationship between the socially undesirable dark triad personality traits and childhood traumas, as this understanding can help mitigate negative outcomes that may arise in the future as a result of the interaction between these two variables. The findings in this area will also provide valuable guidance for psychological counseling services.

This study aims to investigate the relationship between childhood traumas, dark triad personality traits (Machiavellianism, narcissism, and psychopathy), and obsessive beliefs, as well as the potential mediating effect of these traits in the relationship between childhood traumas and obsessive beliefs among university students. With consideration of all the variables involved, the study seeks to address the following research questions:

Research Questions:

1. Is there a significant relationship between childhood traumas, dark triad personality traits, and obsessive beliefs?
2. Do childhood traumas, dark triad personality traits, and obsessive beliefs differ significantly by gender?
3. Do dark triad personality traits have a mediating effect on the relationship between childhood traumas and obsessive beliefs?

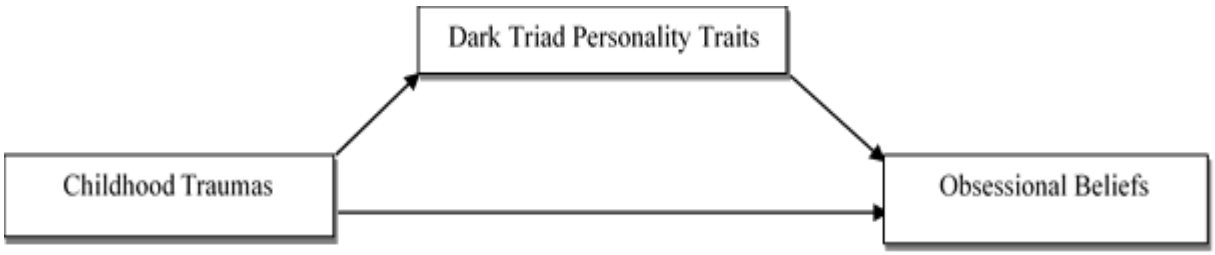

Figure 1. The mediation model

Method

The study employed the correlational survey model, which aims to determine the existence and degree of change between two or more variables (Karasar, 2016).

Participants

The convenience sampling method was used in the study (Büyüköztürk et al., 2013). Participation in the study was made on a voluntary basis, and consent forms were obtained from all participants before the procedure. Initially, 508 volunteers filled out the forms, and 28 volunteers were excluded from the analysis after single and multiple extreme value analyses. Consequently, the finalized sample of the study consisted of 480 volunteer

university students, of whom 306 were female (63.8%) and 174 were male (36.3%). Of the participants, 92.5% were between the ages of 18 and 24, and 7.5% were over 25 years old.

Data Collection Tools

Childhood Trauma Questionnaire (CTQ)

The Childhood Trauma Questionnaire developed by Bernstein et al. (1994) was used by the researchers to measure the participants' childhood traumas. The scale offers separate scores for its three sub-dimensions, namely physical neglect and abuse, emotional neglect and abuse, and sexual abuse, in addition to a total score. In the original study, Cronbach's alpha internal consistency coefficients ranged from .79 to -.94 (Bernstein et al., 1994). The adaptation of the study to Turkish was carried out by Aslan and Alparslan (1999), and in the study, Cronbach's alpha internal consistency coefficients were reported as .94 for physical neglect and abuse, .95 for emotional neglect and abuse, .94 for sexual abuse, and .96 for the overall scale (Aslan & Alparslan, 1999). In this study, the skewness and kurtosis values indicated that the scale was normally distributed (1.40, 1.52, respectively), and Cronbach's alpha internal consistency coefficient for all scale items was found to be .94. The Cronbach's alpha internal consistency values of the sub-dimensions of the scale were determined as .89 for physical abuse, .90 for emotional abuse, and .84 for sexual abuse.

Short Dark Triad (SD3)

The Short Dark Triad developed by Jones and Paulhus (2014) was used to measure the Dark Triad personality traits of the participants. The Short Dark Triad has three sub-dimensions, namely Machiavellianism, narcissism, and psychopathy. The Cronbach's alpha internal consistency coefficients of the original Brief Short Triad were found to be .77 for the Machiavellianism sub-dimension, .71 for the Narcissism sub-dimension, and .80 for the Psychopathy sub-dimension (Jones & Paulhus, 2014). The measurement tool was adapted to Turkish by Ermiş et al. (2018). The Cronbach's alpha internal consistency coefficients calculated in the Turkish adaptation study were .93 for the Machiavellianism dimension, .93 for the Narcissism dimension, and .91 for the Psychopathy dimension. In this study, the skewness and kurtosis values indicated that the Short Dark Triad was normally distributed (-.02, .03, respectively) and was in the normal distribution range, and Cronbach's alpha internal consistency coefficient was .74. The reliability coefficients of the sub-dimensions of the scale (.72 for Machiavellianism and Narcissism, .78 for psychopathy) were found to be acceptable.

Obsessional Beliefs Questionnaire (OBQ-44)

Developed by the Obsessive-Compulsive Cognitions Working Group, this questionnaire was designed to measure dysfunctional beliefs considered important in the development and maintenance of obsessive-compulsive disorder (OCD). The sub-dimensions of the questionnaire have been determined as (1) responsibility/perception of danger; (2) perfectionism/certainty; and (3) caring/control of thoughts. The Cronbach's alpha internal consistency coefficient of the Obsessional Beliefs Questionnaire was found to be around .87 for the total and sub-dimensions (Steketee et al., 2001). The Turkish validity and reliability study of the scale was carried out by Boysan et al. (2010). The Cronbach's alpha internal consistency coefficient of the scale was reported as .95; the internal consistency coefficients of the sub-dimensions were reported as .88 for inflated responsibility/perception of danger .88 for perfectionism/certainty, and .86 for caring/control of thoughts (Boysan et al., 2010). In this study, the skewness and kurtosis values indicated that the Obsessional Beliefs Scale was normally distributed (-.02, .20, respectively). The total internal consistency coefficient of the scale was found to be .92; the internal consistency coefficients of the sub-dimensions were reported as .85 for inflated responsibility/perception of danger and perfectionism/certainty and .86 for caring/control of thoughts.

Ethics Committee Approval

The experiment started with the permission of the Dicle University Ethics Committee, dated October 21, 2022, and numbered 376660.

Data Analysis

IBM SPSS-24 (Statistical Package for Social Sciences) package program and PROCESS Macro were used in the analysis of the collected data. In inter-group comparisons, an independent sample t-test was used to make comparisons between two parametric groups. The Pearson correlation coefficient was calculated to determine the relationships between the variables in the study. The mediator variable analyses were carried out using the

Bootstrap method proposed by Hayes (2013), which is also called "ordinary least squares regression". The bootstrap method is a widely used method as it allows one to identify the factors affecting the relationships between variables (Preacher & Hayes, 2008). Indeed, Hayes (2009) suggests that bootstrapping is a reliable, state-of-the-art method that can be used to estimate the direct and indirect effects of the mediation model. The bootstrap method is based on creating sub-samples from the data of the existing sample and comparing the resulting parameters with the results of the main sample. Accordingly, calculations regarding the mediating roles of dark triad personality traits in the relationship between childhood traumas and obsessional beliefs were performed using IBM SPSS 24.0 (Hayes, 2013) via PROCESS Macro. Data were analyzed at a 95% confidence interval, and $p < .05$ was used for statistical significance.

Findings

The data were analyzed using the SPSS-24 program. Since the skewness and kurtosis values of the scales used in the study for the collection of data were found to be ±1.5, thus showing a normal distribution, it was deemed appropriate to perform the analyzes with parametric tests (Fidell & Tabachnick, 2013).

Table 1. Descriptive Statistics and Correlation Analysis Findings

	M	***SD***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Machiavellianism	3.34	.63	1											
2. Narcissism	3.00	.63	.14**	1										
3. Psychopathy	2.35	.67	.34**	.26**	1									
4. Short Dark Triad	2.90	.46	.69**	.65**	.77**	1								
5. Responsibility/Perception of Danger	4.33	1.00	.34**	.09*	.25**	.32**	1							
6. Perfectionism/Certainty	4.57	.97	.30**	.05	.20**	.26**	.73**	1						
7. Caring/Control of thoughts	3.46	1.03	.25**	.03	.30**	.28**	.68**	.55**	1					
8. Total of Obsessive Beliefs	4.12	.88	.34**	.07	.29**	.33**	.91**	.86**	.85**	1				
9. Emotional Neglect and Abuse	1.86	.57	.08	-.01	.25**	.16**	.10*	.04	.15**	.12**	1			
10. Physical Neglect and Abuse	2.01	.65	.08	.01	.24**	.16**	.14**	.07	.17**	.14**	.78**	1		
11. Sexual Abuse	1.27	.60	.04	.04	.21**	.14**	.05	-.03	.10*	.05	.47**	.56**	1	
12. All Childhood Traumas	1.71	.52	.08	.01	.27**	.18**	.11**	03	.17**	.12**	.88**	.90**	.78**	1

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

According to the findings of the correlation analysis, it has been determined that childhood traumas are significantly and positively associated with both dark triad personality traits (r = .18**) and obsessive beliefs (r = .12**). When evaluated in the context of subscales, it has been found that childhood traumas are significantly and positively associated with psychopathy personality traits (r = .27**), as well as with the responsibility/perception of danger subscale (r = .11*) and the caring/control of thoughts subscale (r = .17**) of obsessive beliefs.

Table 2. Comparison of Dark Triad Personality Traits, Obsessional Beliefs, and Childhood Traumas by Gender

	Gender	*N*	M	*SD*	*SE*	*t*	*p*
Machiavellianism	Female	306	3.30	.62	.035	1.847	.066
	Male	174	3.41	.65	.049	1.873	.062
Narcissism	Female	306	3.01	.65	.037	-.691	.490
	Male	174	2.97	.59	.045	-.674	.500
Psychopathy	Female	306	2.25	.67	.038	4.128	.000*
	Male	174	2.51	.66	.049	4.105	.000*
Responsibility/Perception of Danger	Female	306	68.3	15.9	.912	1.690	.092
	Male	174	70.9	16.3	1.238	1.701	.090

Perfectionism/Certainty	Female	306	72.4	15.6	.089	1.308	.192
	Male	174	74.3	15.3	1.161	1.300	.194
Caring/Control of thoughts	Female	306	40.8	11.9	.068	1.618	.107
	Male	174	42.7	13.2	1.002	1.663	.097
Emotional Neglect and Abuse	Female	306	38.2	13.0	.747	.088	.930
	Male	174	38.3	11.0	.839	.084	.933
Physical Neglect and Abuse	Female	306	29.6	9.37	.536	.341	.733
	Male	174	29.9	8.88	.673	.336	.737
Sexual Abuse	Female	306	6.46	3.08	.176	-.988	.324
	Male	174	6.18	2.88	218	-.971	.332

*$p<.05$, **$p<.01$

To seek answers to the third research question, an independent samples t-test analysis was performed to determine whether there were differences between genders in terms of the variables of dark triad personality traits, having obsessional beliefs, and being exposed to childhood traumas, and only the findings with a significant difference were reported (Table 2). Accordingly, in the psychopathy dimension of dark triad personality traits, male participants were found to have obtained significantly higher mean scores (M = 2.51, SD = .66) than female participants (M= 2.25, SD =.67).

Table 3: The Indirect Effects of Physical Neglect and Abuse on Obsessive Beliefs

Indirect Effects	β	SE	%95 Confidence Interval	
			Lower Bound	Upper Bound
Physical Neglect and Abuse → Machiavellianism → Obsessive Beliefs	.09	.05	-.0036	.0828
Physical Neglect and Abuse → Narcissism → Obsessive Beliefs	.01	.05	-.0092	.0066
Physical Neglect and Abuse → Psychopathy → Obsessive Beliefs	.25	.05	.0284	.1146

According to the findings obtained from the analysis conducted using the Process Macro program, it was found that the direct effect of physical neglect and abuse on obsessive beliefs was significant (β = .22, SE = .06, t = 3.30, p < .01). On the other hand, when Machiavellianism (β = .09, SE = .05, %95 CI = -.00/.08), narcissism (β = .01, SE = .05, %95 CI = -.00/.00) and psychopathy (β = .25, SH = .05, %95 CI = .02/.11) were included as mediating variables in the analysis, it was observed that only the indirect effect of psychopathy on obsessive beliefs was significant. Therefore, it was determined that psychopathy acts as a mediator in the relationship between physical neglect and abuse and obsessive beliefs.

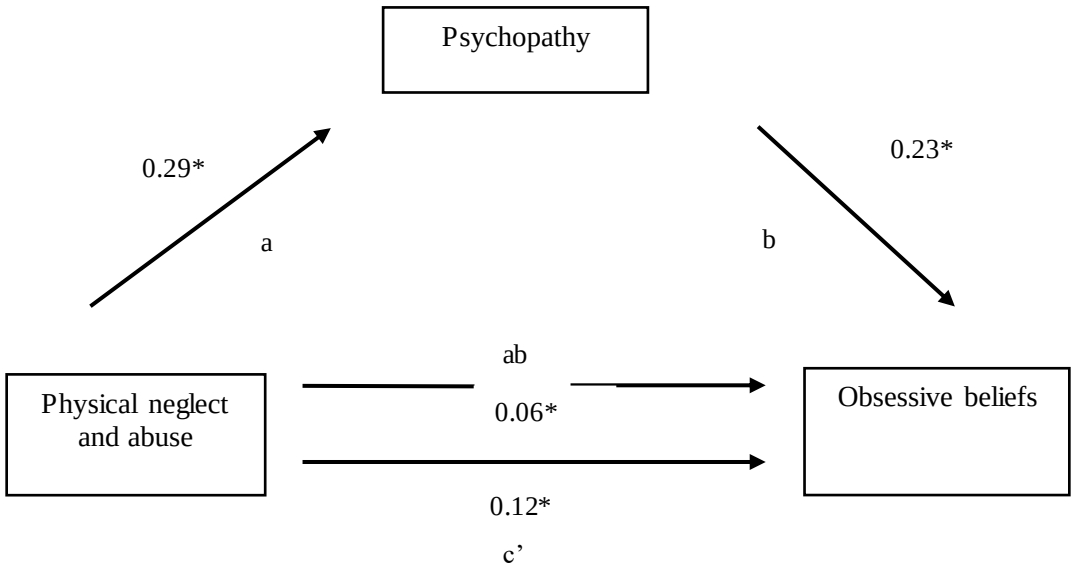

Figure 2: The Mediating Role of Psychopathy in the Relationship between Physical Neglect and Abuse and Obsessive Beliefs

Note: *p<05, **p<.01. a: The direct effect of physical neglect and abuse (predictive variable) on psychopathy (mediator variable); b: The direct effect of psychopathy on obsessive beliefs (outcome variable); c': The direct effect of physical neglect and abuse on obsessive beliefs when controlling for psychopathy; ab: The indirect effect of physical neglect and abuse on obsessive beliefs when the mediator variable is added to the model. Unstandardized *B* values are presented.

Table 4: The Indirect Effects of Emotional Neglect and Abuse on Obsessive Beliefs

Indirect Effects	*ß*	SE	%95 Confidence Interval	
			Lower Bound	Upper Bound
Emotional neglect and abuse→ Machiavellianism → Obsessive Beliefs	.09	.04	-.0001	.0743
Emotional neglect and abuse → Narcissism → Obsessive Beliefs	-.02	.04	-.0062	.0074
Emotional neglect and abuse → psychopathy→ Obsessive Beliefs	.26	.04	.0305	.1112

According to the findings obtained from the analysis conducted using the Process Macro program, it was found that the direct effect of emotional neglect and abuse on obsessive beliefs was significant (*ß* = .16, *SE* = .06, *t* = 2.63, p < .05) On the other hand, when Machiavellianism (*ß* = .09, *SE* = .04, *%95 CI* = -.00/.07), narcissism, (*ß* = -.02, *SE* = .04, *%95 CI* = -.00/.00) and psychopathy (*ß* = .26, *SE* = .04, *%95 CI* = .03/.11) variables were included as mediating variables in the analysis, it was observed that only the indirect effect of psychopathy on obsessive beliefs was significant. Therefore, it was determined that psychopathy acts as a mediator in the relationship between emotional neglect and abuse and obsessive beliefs.

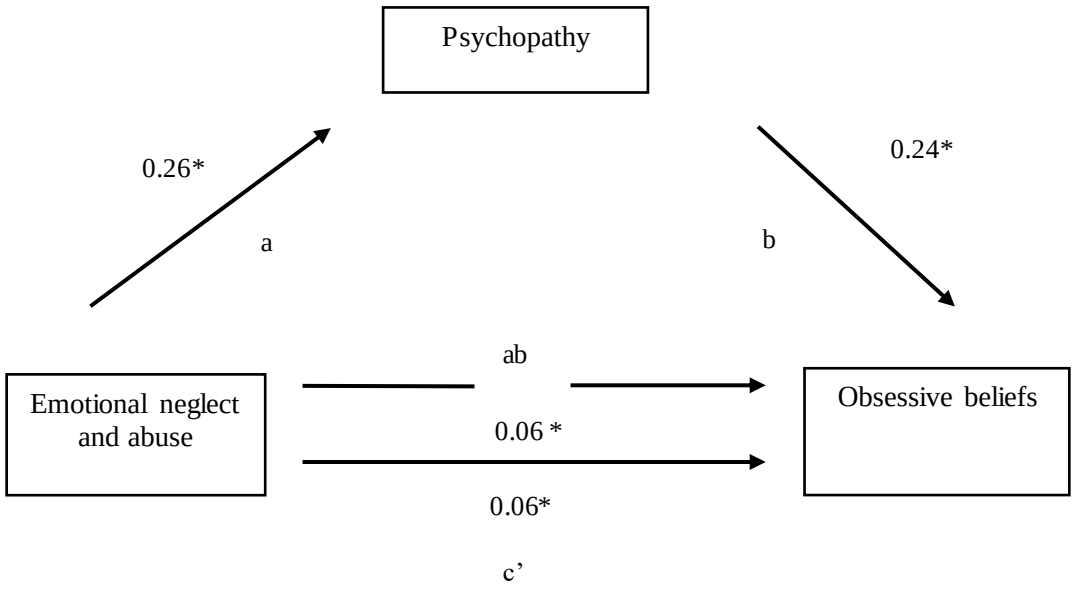

Figure 3: The Mediating Role of Psychopathy in the Relationship between Emotional Neglect and Abuse and Obsessive Beliefs
Note: *$p<05$, **$p<.01$. The direct effect of emotional neglect and abuse (predictive variable) on psychopathy (mediator variable); b: The direct effect of psychopathy on obsessive beliefs (outcome variable); c': The direct effect of emotional neglect and abuse on obsessive beliefs when controlling for psychopathy; ab: The indirect effect of emotional neglect and abuse on obsessive beliefs when the mediator variable is added to the model. Unstandardized *B* values are presented.

Table 5: The Indirect Effects of Sexual Abuse on Obsessive Beliefs

Indirect Effects	*ß*	*SE*	%95 Confidence Interval	
			Lower Bound	Upper Bound
Sexual Abuse → Machiavellianism →Obsessive Beliefs	.05	.04	-.0126	.0553
Sexual Abuse → Narcissism → Obsessive Beliefs	.05	.04	-.0120	.0059
Sexual Abuse →Psychopathy→ Obsessive Beliefs	.21	.05	.0273	.1081

*p<05, **$p<.0$

According to the findings obtained from the analysis conducted using the Process Macro program, it was found that the direct effect of emotional neglect and abuse on obsessive beliefs was significant (*ß* = .07, *SE* = .06, *t* = 1.12, p<.01). On the other hand, when Machiavellianism (*ß* = .05, *SE* = .04, *%95 CI* = -.01/.05), narcissism (*ß* = .05, *SE* = .04, *%95 CI* = -.01/.00), and psychopathy (*ß* = .21, *SE* = .05, *%95 CI* = .02/.10) variables were included as mediating variables in the analysis, it was observed that only the indirect effect of psychopathy on obsessive beliefs was significant. Therefore, it was determined that psychopathy acts as a mediator in the relationship between sexual abuse and obsessive beliefs.

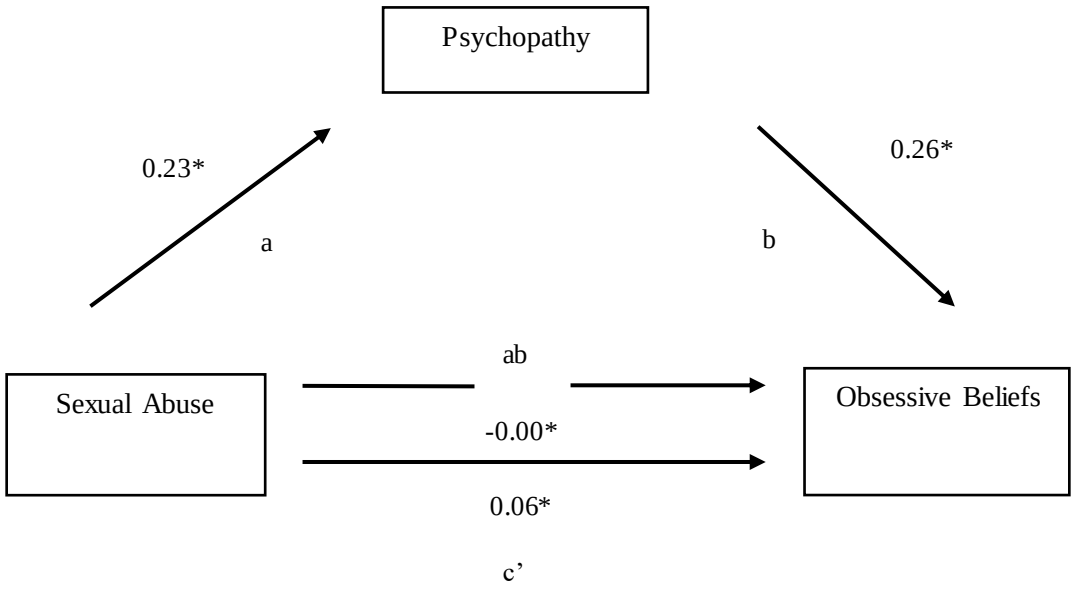

Figure 4: The Mediating Role of Psychopathy in the Relationship between Sexual Abuse and Obsessive Beliefs

Not: *p<05, **p<.01. a: The direct effect of sexual abuse (predictive variable) on psychopathy (mediator variable). b: The direct effect of psychopathy on obsessive beliefs (outcome variable); c': The direct effect of sexual abuse on obsessive beliefs when controlling for psychopathy; ab: The indirect effect of sexual abuse on obsessive beliefs when the mediator variable is included in the model. Non-standardized *B* coefficients are provided.

Discussion

This study investigated the relationships between childhood traumas, dark triad personality traits (Machiavellianism, narcissism, and psychopathy), and obsessional beliefs among university students. The findings revealed that childhood traumas are significantly and positively associated with both dark triad personality traits and obsessional beliefs. When examined in terms of sub-dimensions, it was found that childhood traumas were significantly and positively associated with psychopathic personality traits and the 'responsibility/perception of danger and 'caring/control of thoughts sub-dimensions of the obsessional beliefs questionnaire. Furthermore, the results of the mediation analysis demonstrated that psychopathic personality traits had a mediating effect on the relationship between the sub-dimensions of childhood traumas and obsessional beliefs.

The analysis examined whether there were significant variations in childhood traumas, dark triad personality traits, and obsessional beliefs based on gender. The results revealed that there was a significant difference between genders in terms of the psychopathy sub-dimension of the dark triad personality traits. Specifically, male participants obtained significantly higher scores in the psychopathy sub-dimension compared to female participants. These findings are concurrent with previous studies addressing gender differences in terms of the dark triad psychopathy sub-dimension and consistently demonstrating that the rate of psychopathy is higher in males than in females (Strand & Belfrage, 2005; Power & Oltmanns, 2012). Psychopathy is characterized by continuous antisocial behavior, aggression, and impulsivity. A relevant study found that psychopathy is a primary predictor of a lack of empathy within the dark triad personality sub-dimensions (Wai & Tiliopoulos, 2012). Additionally, some aggressive behaviors and a tendency to commit crimes are observed in individuals who display psychopathic personality traits (Muris et al., 2017). Existing literature has shown that aggression is higher in males (Camadan & Yazıcı, 2017; Grijalva et al., 2015; Strand & Belfrage, 2005). Societal expectations and norms contribute to the differential upbringing of males and females, with males being encouraged to exhibit leadership, competitiveness, and aggression. Women, on the other hand, are raised to be gentle and compassionate, making the display of aggressive behaviors by women appear atypical (Camadan & Yazıcı, 2017). Therefore, it can be argued that society perceives men expressing anger and engaging in aggressive behavior as more socially acceptable. The relevant literature shows that males get higher scores than females in all sub-dimensions of the dark triad (Jonason et al., 2010; Jonason & Davis, 2018; Strand & Belfrage, 2005). A meta-analysis conducted by Muris et al. (2017) further supports these findings, reporting that males scored

higher in all dark triad sub-dimensions than females. In light of this information, it is believed that these significant gender differences may be due to the gender roles that society imposes on both women and men.

The findings of the study revealed a positive and significant relationship between childhood traumas (physical abuse or neglect, emotional abuse or neglect, and sexual abuse) and dark triad personality traits. Accordingly, it can be suggested that individuals who have experienced childhood trauma have a higher tendency to exhibit dark triad personality traits. Kircaburun et al. (2019) conducted a study that revealed a link between emotional abuse as a form of childhood trauma and the emergence of dark triad personality traits, which, in turn, was associated with an increase in cyberbullying. Consistent with these findings, another recent study found that childhood traumas positively predicted bullying (Zhang et al., 2022). Bullying, characterized by interpersonal aggression and perpetrated by individuals on other individuals, can be considered a manifestation of the dark triad of personality traits. In a study, it was shown that dark triad personality traits are associated with aggression (Muris et al., 2017). In this sense, these findings, which reveal the relationship between childhood traumas and aggression, suggest that personality organization may also play a role in this association.

Another finding of the study was the significant positive relationships between childhood traumas and sub-dimensions of obsessive beliefs: responsibility, perception of danger, and caring or control of thoughts. According to this finding, abuse and neglect experienced by individuals in the past seem to increase the possibility of developing dysfunctional obsessional beliefs. This finding is consistent with previous research in the related literature (Briggs & Price, 2009; Ertaç, 2021; Salkovskis & Forrester, 2002). The way children are exposed to abuse and neglect may shape their experiences in life as well as their reactions, which may give rise to maladaptive patterns of thinking. Traumatic events may instill in individuals the belief that they have no control over their lives (Dube et al., 2005). Therefore, abused and/or neglected people may prioritize regaining the control they have lost as their primary concern. It can also be argued that these individuals' fear of losing control over their behaviors and thoughts triggers obsessional beliefs, causing stress and anxiety. Indeed, according to cognitive science, stressful life events trigger obsessions (Rachman & Stanley, 1998). Considering childhood traumas are an important source of stress, it can be argued that these traumas pave the way to obsessional beliefs. Parallel to this assumption, there is existing literature indicating that childhood traumas may have a crucial role in the emergence of obsessive-compulsive disorder and the transformation of thoughts into obsessions (Briggs & Price, 2009; Taylor, 2000). Childhood traumas affect the way individuals perceive the world and may lead to the adoption of unhealthy coping mechanisms (Gipple et al., 2006). They are known to have a significant role in the increase of individuals' perception of imminent threat, the emergence of feelings of guilt and shame, and the occurrence of recurrent thoughts (Webb et al., 2007). Therefore, it is thought that individuals may be more prone to developing dysfunctional thoughts as a means of coping with traumatic experiences. Obsessional beliefs also play a role in the development and maintenance of obsessive-compulsive disorder symptoms (e.g., Abramowitz et al., 2006; Barahmand et al., 2014). There are studies in the literature suggesting that childhood traumas positively predict obsessive-compulsive disorder. In these studies, participants who suffered from obsessive-compulsive disorder reported more childhood traumas than those who did not (Carpenter et al., 2011; Çelikel & Beşiroğlu, 2008; Lochner et al., 2002). Therefore, since childhood traumas exacerbate obsessional beliefs, it is thought that they may constitute a risk factor for the development of obsessive-compulsive disorder as well.

Based on the findings of this study, significant positive relationships were found between all sub-dimensions of the Childhood Trauma Questionnaire—emotional, physical, and sexual abuse—and psychopathy, which is one of the sub-dimensions of the dark triad. The results of the mediation analysis performed to better understand the nature of this relationship showed that the relationship between childhood traumas and obsessional beliefs was mediated by psychopathy, one of the sub-dimensions of the dark triad. This finding is consistent with those of the few similar studies available in the literature. For instance, a study carried out with the participation of juvenile delinquents concluded that emotional and physical abuse exacerbates psychopathic personality traits, and childhood traumas pose a risk for the emergence of these traits (Farina et al., 2018). In another recent study, a significant relationship was found between childhood traumas and dark triad personality traits (Merluşcă & Chiracu, 2018). A Turkish study concluded that there is a positive and significant relationship between childhood traumas and dark triad personality traits in university students (Ercin, 2020). The existing literature suggests that childhood traumas play a causal role in the emergence of psychopathic personality traits, which are manifested by behaviors such as aggression and anti-sociality (Graham et al., 2012; Schimmenti et al., 2015). Thus, the findings from this study align with the existing literature. It is thought that feelings such as guilt, shame, anger, and insecurity, which arise as a result of traumatic events experienced in childhood, negatively affect mental integrity as well as self-development and may play a role in the emergence of dark triad personality traits. Therefore, it can be argued that childhood traumas hinder personal development because of

the above-mentioned negative emotions, as well as push individuals towards developing dark triad personality traits.

Conclusion and Recommendations

Overall, this study has found a significant relationship between childhood traumas and dark triad personality traits, as well as obsessional beliefs. Furthermore, it has been revealed that psychopathy has a mediating effect on the relationship between childhood traumas and obsessional beliefs. Childhood traumas significantly impact an individual's life. Such traumas may yield adverse consequences in the long term in terms of cognitive, psychological, emotional, and personality development (Herrenkohl et al., 2013; Kendall-Tackett, 2002; Bellis et al., 2014; Xie et al., 2018). Considering the possible impacts of childhood traumas, which may lead to chronic issues in an individual's life, understanding the mechanisms with which childhood traumas may be associated may contribute to the development of preventive and protective interventions. Addressing the traumas children experience may enable the early treatment of potential psychological consequences and help prevent the emergence of such problems in adulthood. The findings of this study may serve as a guide for the individual and group counseling practices to be offered in the psychological counseling centers of the universities. It is recommended to provide preventive and protective interventions for individuals who are likely to have had childhood traumas (such as those who lost a parent, experienced poverty, etc.). Additionally, services should be provided for children who have been subjected to maltreatment and their families. Furthermore, it will be beneficial to carry out informative training programs on abuse and neglect within the scope of school psychological counseling services for parents whose children are at the primary, secondary, and high school levels. In addition, it is recommended that the subjects such as anger control and gender should be addressed by school counselors starting from primary school and secondary school levels by doing group work.

As is the case in this study as well, there are certain limitations. Further studies on the variables presented in this study conducted with a larger sample would provide more comprehensive information on the subject. The predominance of self-reported data collection tools pertaining to childhood traumas and other variables is based on the assumption that individuals respond objectively, free from self-bias and social desirability. However, it should be acknowledged that establishing universally applicable causal links is challenging due to the individual nature of childhood traumas. Cross-sectional studies may partially address this limitation, although their ability to establish causal relationships is limited. It is anticipated that investigating the long-term effects of childhood traumas in future studies and carrying out qualitative studies to examine in depth their relationships with different variables would make noteworthy contributions to the existing literature.

Conflicts of Interest

There is no conflict of interest in this study.

Ethics Committee Approval

This study was conducted based on the permission obtained from the Dicle University Ethics Committee dated 21.10.2022 and numbered 376660

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Representation of Ataturk's Leadership Qualities in "The 8th Grade Textbook for The History of Turkish Revolution and Kemalism'', in the Context of the Skills Relevant to the 21st Century

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Representation of Ataturk's Leadership Qualities in "The 8th Grade Textbook for The History of Turkish Revolution and Kemalism'', in the Context of the Skills Relevant to the 21st Century**

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Abstract

Textbooks are among the most important means of education in terms of instilling leadership skills in students. The characters presented as models in the textbooks play an important part in building up such leadership skills with the help of quotes from such characters, texts written with reference to them, and the activities developed accordingly. Thanks to his leadership qualities, Mustafa Kemal Ataturk is one such character who continues to provide guidance even after a century. As a model for the students, he arguably plays a role in helping them develop leadership skills. Therefore, it is important to analyze his description in the textbook from a scientific perspective. Against this background, this study presents an analysis of the 8th grade textbook for "The History of Turkish Revolution and Kemalism" course used in the academic year 2021-2022, with reference to Ataturk's leadership traits and the types of leadership deemed important in the 21st century (strategic, authentic, charismatic, servant, transformative, transactional, etc.). The data gathered through document review was then subjected to descriptive analysis. The analysis led to the conclusion that the text represented Ataturk's leadership traits in tune with the types of leadership prevailing in the 21st century. It is also understood that Ataturk's strategic, visionary, transformative, charismatic, entrepreneurial, and creative leadership skills were more prominent in the text.

Keywords: 21st Century skills, History of turkish revolution and kemalism, Leadership skills, Textbook, Mustafa kemal atatürk

Introduction

The roots of leadership extend back to the times when humans began to live in communities. Such early attempts at communal living soon led to the perceived need for the administration of the community and thus the need for leaders to provide such administration (İbicioğlu, Özmen & Taş, 2009). In those times, leadership was a trait referring to individuals with substantial influence over large masses, representing a form of power. In time, this concept came to be associated with superhuman qualities, even godly characteristics (Hatch, Kostera & Kozminski, 2006). The word leader is based on the root "lead", which refers to showing the "way" or "direction" (Aldair, 2005: 66). The leader is defined as "the person who leads and guides, with the ability to perceive and predict her followers' needs and wants and the creativity to grasp them" (Tunçer, 2012: 291). In earlier ages, it was also known to be associated with rulers, military commanders, princes, chiefs, or kings (Stogdill & Bass, 1981). Leadership, in turn, is defined as "the art of motivating and coordinating people working towards the organization one leads" (Tunçer, 2012: 291). Even though the literature does not highlight a common definition of leadership as a concept, various scholars have emphasized standing out in the group (Mumford, 1906), being in the center of a movement (Cooley, 1902; Knickerbocker, 1948), the ability to impress and influence others (Bennis & Nanus, 1985; Bogardus, 1934; Katz & Kahn, 1978; Pagonis, 1992; Rauch & Behling, 1984), personality traits to draw admiration (Kilbourne, 1935), the ability to lead individuals towards a shared objective (Hempfill & Cons, 1957; Koontz & O'Donnel, 1955; Stogdill, 1974), the ability to facilitate interpersonal interaction and communications (Tannenbaum, Weschler & Massarik, 1961), leading the

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way in solving problems in line with the goals at hand (Dubrin, 1978), overseeing action and creating the future (Sullivan & Harper, 1996) as qualities expected from a leader. The leadership perspective has undergone change in the age of enlightenment, with enlightenment thinkers arguing that "every human being can be his own leader" (Goffee & Jones, 2011). Today, rapid developments in science and technology have brought about significant competition among organizations, rendering leadership even more crucial. Indeed, leadership is now a concept cherished and appreciated by a lot of sectors of human activity and is considered an important skill necessitated by the 21st century (Tuğluk & Altın, 2020).

From an academic point of view, leadership came to be discussed in the early decades of the 20th century and is now the subject of various theories expressing various scholars' interpretations. A glance at the organizations reveals attempts to explain and understand leadership from the perspective of the rather conventional 'great man' theory, as well as perspectives focusing on traits, behaviors, and contingencies (Bakan-Doğan, 2013; Dikmen, 2012; Dikmen-Ada, 2012; Özkara & Sağlam-Arı, 2019; Şahin, 2019; Tuğluk & Altın, 2020). Nowadays, however, the concept of leadership is assessed with reference to its development, transformation, and differentiation in line with the demands of the 21st century. Today's leadership theories exhibit various approaches to the concept, including the modern paradigm (Dinler, 2018; Gürer, 2019; Sağbaş, 2021; Tuğluk & Altın, 2020), contemporary perspectives (Doğan, 2016), postmodern perspectives (Dikmen, 2012), current perspectives (Bakan & Doğan, 2013; Dikmen, 2012; Erişen, 2017; Özkara & Sağlam-Arı, 2019), and novel perspectives (Baker-Arapoğlu, 2021; Dikmen-Ada, 2012; Şahin, 2019; Tekeli, 2018; Yılmaz, 2014); Looking at the literature, one can notice references to certain types of leadership, including strategic, authentic, charismatic, servant, transformative, ethical, transactional, autocratic, laissez-faire, democratic/participatory (Dinler, 2018; Gürer, 2019; Sağbaş, 2021; Tuğluk and Altın, 2020), spiritual, cultural, visionary, entrepreneurial, and creative (Dikmen, 2012; Dikmen-Ada, 2012), under the umbrella of the modern leadership paradigm rising on top of the synthesis of these leadership perspectives..

In contrast to the century that preceded it, the 21st century stands out as one where manpower is becoming irrelevant and even the mental skills of human beings are on the way to being replaced by artificial intelligence. Various circles of debate voice the need for schools to emphasize life skills such as critical thinking, communication, cooperation, and coping with change instead of the technical skills they were accustomed to providing previously (Harari, 2018). These arguments led to various approaches embraced by various organizations, based on which skills the 21st century demands. These approaches, with the contributions of various institutions and organizations (e.g., P21, Metiri Group, EnGauge, OECD, AACU, ISTE, and Macarthur Foundation), culminated in the categorization of 21st century skills as learning and innovation skills; information, media, and technology skills; and life and career skills. Among these, life and career skills are significant for the purposes of this study, as they contain leadership skills as well (Dede, 2009).

It is evident that expectations regarding the qualities individuals should have have been changing in response to the social, economic, political, and technological developments brought about by the 21st century. Such change affected the education systems as well and necessitated certain changes in the knowledge, skills, and qualifications individuals are expected to have (Cansoy, 2018; Dursun, 2022). The change led to a revision of the qualifications of the education programs applied at schools so as to cover knowledge, skills, meta-learning, and character traits as the primary aspects of education in the 21st century. Learning to exhibit character is expected to instill awareness, curiosity, courage, endurance, ethical values, and leadership behaviors in individuals (Fadel, Bialik, & Trilling, 2015). By providing the students of the educational environments of the 21st century with the seeds of leadership skills, they are raised as strong, creative, highly motivated individuals with a will to learn new knowledge (Zehir-Gülebi & Bayar, 2019), capable of guiding others effectively with direct influence and inspiration (Hamarat, 2019), combined with consistent and ethical behavior, the ability to provide guidance to others, embracing responsibility with others, and guiding one's team towards its objective (Aydın, 2019; Güçlü, 2022). Leadership in education arose as a strong discourse, not only facilitating organizational and pedagogical development on the part of teachers and schools to help students learn better but also paving the way for equality, social justice, and participation in education (Hangartner & Svaton, 2022). Doing so is a shot at equipping individuals with the skills and experiences to enable them to perform well in leadership roles demanded by the 21st century (Leblebici, 2008). The concept of competition, which took over the whole world in the 21st century, increased the importance of leadership skills for educational establishments, prioritizing efficiency and quality. Arming individuals with leadership skills will increase their efficiency in their daily lives as well as through their future careers, and the education materials to be used in the 21st century are being designed specifically to provide those skills (İdin, 2019).

Without doubt, textbooks are among the most important materials for instilling leadership qualities in students. In addition to their guiding role in learning, acquiring, and organizing knowledge (Seguin, 1989), textbooks also play a major role in helping students develop leadership skills. The characters presented as models in the textbooks, quotations from them, texts written with reference to them, and the activities developed provide a

picture of the leadership traits of such persons, shaping the students' image of leadership. Presenting insights into the lives of world-renown leaders plays an important part in helping students develop leadership skills. Indeed, all nations on the globe present a model of a leader profile or other for the students by including certain texts and cases to serve as models from the lives of their national heroes in textbooks (Aytan, Çalıcı, & Ertem, 2018). In this context, Mustafa Kemal Ataturk stands out as a crucial example of a leader in Turkey as well as the wider world, given his extraordinary efforts in the years of national struggle for independence as well as the steps he took to modernize the Turkish nation after the establishment of the Republic. That is why the representation of Ataturk's leadership traits in textbooks is very important in helping students develop leadership skills.

A glance at the literature on Ataturk's leadership traits reveals references to having an open mind (Kırel, 2001), standing firm on crucial principles (Özbudun, 1986; Tural, 1999; Tünay, 1985), having insights and experience (Aslan, 2008; Kırel, 2001; Tural, 1999), analysis-synthesis skills (Kolburan & Tasa, 2017), habit of providing insights (Kırel, 2001), ability to draw masses with him (Özlü, 2011), flexibility (Dinler, 2018; Kırel, 2001; Taş, 2009), realism (Aslan, 2008; Dinler, 2018; Kırel, 2001; Özbudun, 1986), embracing a democratic perspective (Arıkan, 2001; Dinler, 2018; Dönmezer, 1991; Erendil, 1986; Köse, 2021; Özbudun, 1986; Uzun, 2009; Yüksel & Açıkgöz, 2010), autocratic approach (Arıkan, 2001; Aslan, 2008; Kılıç-Özkaynar, 2017; Köse, 2021), will to stand for duty (Kırel, 2001), creativity (Laçin, 1997), reliability (Cora, 2016; Kırel, 2001), impressiveness (Yüksel & Açıkgöz, 2020), honesty (Cora, 2016), entrepreneurial nature (Geçikli, 2012; Tekeli, 2018), confidence (Tural, 1999), orientation towards action (Aşkun, 1998; Bursalıoğlu, 1983; Özbudun, 1986; Vahapoğlu, 1998), ability to persuade (Kırel, 2001; Tural, 1999), taking initiative (Aslan, 2008; Kırel, 2001), being a good judge of character (Kırel, 2001), appreciation of people (Kırel, 2001; Özbudun, 1986), devoting himself to the task (Eraslan, 2006; Kırel, 2001; Tekeli, 2018), strong foresight (Murat, 2016; Tünay, 1985), revolutionary perspective (Erendil, 1986; Mumcu, 1997; Taş, 2009; Vahapoğlu, 1998), ability to draw public support, ability to make quick decisions (Kırel, 2001), determination and courage (Aslan, 2008; Aydemir, 1963; Cora, 2016; Eraslan, 2006; Geçikli, 2012; Kırel, 2001; Kongar, 2012; Taş, 2009; Tekeli, 2018; Tural, 1999; Tünay, 1985; Yüksel & Açıkgöz, 2020), patience (Atay, 1990; Dinler, 2018), perfection (Kırel, 2001), cherishing solidarity (Akseki, 2012), will to learn (Aydemir, 1963; Ertan, 2016; Kırel, 2001), pioneering character, principled standing, problem-solving attitude, extraordinary character, habit of taking responsibility, strategical awareness, (Kırel, 2001), organizational skills (Aktaş, Türk-Aktaş & Erol 2015; Kırel, 2001), cherishing merit (Aslan, 2008; Banoğlu, 1955), vision (Aslan, 2008; Dinler, 2018; Eraslan, 2006; Kırel, 2001; Taş, 2009; Tekeli, 2018), ability to manage time and supervise (Kansu, 1998; Kırel, 2001; Köse, 2021), keeping an ear for the public, having a national strategy perspective (Aslan, 2008), emotional intelligence (Geçikli, 2012), versatility (Aslan, 2008; Bursalıoğlu, 1983; Erendil, 1986; Türkmen, 2017), drawing strength from people (Özbudun, 2019), charisma (Akseki, 2012; Aşkun, 1998; Dinler, 2018; Kongar, 2021; Köse, 2021; Özlü, 1986; Sönmez, 2006; Şehit, 2011), transformative approach (Akarslan, 2021; Aktaş, Türk-Aktaş & Erol, 2015; Baykal, 2002; Eraslan, 2006; Erdenir, 2008; Köse, 2021; Taş, 2009; Tekeli, 2018;) and others among leadership traits attributed to him.

In general, these studies present a picture of his leadership nature based on quotations from him, his heroic stances in wars, his foresight and strategic thinking, as well as his versatility. However, no study analyzing the textbook for the "History of Turkish Revolution and Kemalism" course for 8th grade in terms of the leadership skills the 21st century demands was found in the literature. Textbooks are also crucial in terms of presenting Ataturk's leadership traits to students through a number of activities and texts. Moreover, considering the fact that textbooks are essential and effective teaching materials for the development of certain skills in students, the present study also stands out as a unique one to assess the book's effectiveness in representing Ataturk's leadership traits. For this purpose, the textbook used in the academic year 2021-2022 for the History of Turkish Revolution and Kemalism course for 8th grade was analyzed with reference to modern theories of leadership to see which units in the textbook refer to which leadership traits of Ataturk. In this context, the study focuses on the following sub-problems:

- How are leadership traits distributed across domains of learning?

Method

The study employed a qualitative research perspective. Qualitative research is defined as a research activity wherein qualitative data collection methods such as observations, interviews, and document analysis are employed, employing a qualitative process for presenting a realistic and holistic picture of perceptions and events in their natural environment (Yıldırım & Şimşek, 2021). The data used in the study was gathered through document analysis. This technique refers to a detailed analysis and review of texts containing information about the events or concepts studied so as to produce a holistic picture of such information (Creswell, 2017). The

textbook for the History of Turkish Revolution and Kemalism course for 8th grade is the document analyzed in this study. The data gathered through document review was then subjected to descriptive analysis. Descriptive analysis refers to the processing of qualitative data based on a pre-determined framework, the identification of findings, and the interpretation of the findings thus identified. (Yıldırım & Şimşek, 2021).

In line with the purpose of the study, the analysis focused on the presentation of leadership skills—a crucial skill the literature names among the life and career skills required for the 21st century—in the textbook. The analysis is based on the types and traits of leadership widely discussed in current literature and categorized under the modern theory of leadership (Dinler, 2018; Doğan, 2016; Erişen, 2017; Gürer, 2019; Sağbaş, 2021; Tuğluk & Altın, 2020). These types of leadership are Strategic, Charismatic, Visionary, Creative, Transformative, Democratic, Authentic, Cultural, Transactional, Ethical, Servant, Entrepreneurial, Autocratic, Laissez-faire, and Spiritual leadership. The behavior features associated with each type of leadership (codes) are listed based on the literature. *For instance, Charismatic Leadership* covers extraordinariness, an action-oriented attitude, the ability to convince others of the validity of the goals set, a high level of confidence, motivating and inspiring the followers, the will to initiate social change, determination, etc. behaviors (codes), whereas *Strategic Leadership* covers foresight, developing an authentic vision, significantly and positively influencing others, having an investigative mind, continuous development, and so on. *Visionary Leadership,* in turn, entails reasoning ability, strategic thinking, fighting spirit, innovativeness, a will for continuous learning, and developing a multi-faceted perspective towards developments, among other behaviors. The list of categories and codes is presented in detail in Appendix 1. The analysis of the textbook took place between March 31 and June 9, 2022. In that time frame, each researcher working individually analyzed the text on a weekly basis, as per the assignments for the week. The similarities and differences of the analyses of all three researchers were then discussed in weekly meetings lasting 3 hours (amounting to a total of 30 hours). The weekly discussions culminated in agreed-upon assessments of the statements in the textbook, with reference to the codes and categories providing the analysis framework. A 90% congruence rate was reached through the discussions (Miles & Huberman, 1994). The descriptive analysis of the amount of repetition of individual leadership types and traits with reference to individual content domains is accompanied by quotations from the textbook.

Results

According to Table 1, the analysis of the textbook for the History of Turkish Revolution and Kemalism course in terms of "*The Birth of a Hero*" content domain revealed references to 12 out of 15 types of leadership covered, with Visionary, Strategic, and Charismatic leadership traits of Ataturk standing out. On the other hand, behaviors associated with Cultural, Transactional, and Ethical leadership types were mentioned much less frequently.

Table 1. Findings Regarding "The Birth of a Hero" Domain of Learning

Category	Codes*/F	Total	Category	Codes */F	Total
1. Visionary	1/4, 2/4, 3/1, 5/3, 6/2, 7/18, 8/2, 9/4, 10/1, 11/1, 12/1, 13/1, 14/4	46	7. Entrepreneurial	1/1, 2/1, 4/1, 6/4, 9/1	8
2. Strategic	1/5, 2/5, 4/2, 5/1, 6/1, 7/7, 8/2, 9/2, 12/4, 13/2, 14/2, 16/5, 17/1, 18/3, 19/1, 20/1	44	8. Democratic	1/1, 11/1, 12/1, 20/2, 21/3	8
3. Charismatic	1/11, 2/1, 3/7, 4/3, 5/5, 6/2	29	9. Servant	1/1, 2/2, 4/1	4
4. Transformative	1/3, 2/1, 3/9, 7/1, 9/2, 10/2	18	10. Cultural	1/1, 2/1	2
5. Creative	1/3, 2/3, 4/1, 6/6, 9/4	17	11. Transactional	3/1, 4/1	2
6. Authentic	1/1, 2/1, 4/1, 7/1, 11/1, 12/1, 13/3	9	12. Ethical	4/1, 6/1	2

* The list of codes in Appendix 1.

The most commonly emphasized cases of Visionary Leadership behaviors in this domain of learning stand out as "7: *Inclination to learning at all times and having a multi-dimensional perspective towards events*", "9: *Never fearing failure*", "14: *Predicting events*", and "15: *Taking chances*". An example of behaviors presented in the book as a case of "*inclination to learn at all times*", which is the most frequently mentioned behavior associated with this type of leadership, is as follows:

> *"…Mustafa Kemal learned German language in military schools. Moreover, again from his secondary school education on, he also learned French as a second foreign language. Making special efforts through his education in Istanbul, he took his French to an advanced level. Thanks to his reading habit and proficiency in foreign languages…" (p. 24).*

In this domain of learning, strategic leadership is found to be the second most frequently expressed type of leadership in the textbook. This type of leadership is mostly exhibited through the following behaviors: "*7. Decision-making in tune with the prevailing conditions*", "*1. Foresight*", "*2. Developing an authentic vision"* and *"16. Having a distinct orientation for the future".* The most commonly mentioned type of behavior associated with strategic leadership in the book is "*decision-making in tune with the prevailing conditions*." An example of this type of behavior, as expressed in the book, is provided below:

> *"Before M. Kemal came to Thessalonica, his friends, who were the founders of the Thessalonica branch of the Homeland and Freedom Society, had joined the ranks of the Union and Progress Society. Mustafa Kemal also joined the Union and Progress Society." (p. 26)*

The third most frequently expressed type of leadership in this domain of learning is Charismatic Leadership. In the textbook, the most frequently mentioned behaviors associated with this type of leadership are "*1. Extraordinariness*", "*2. Orientation towards action*", "*3. Appearing in extraordinary times, motivating and inspiring the followers*", and "*5. The will to influence others*". Among these leadership behaviors, the most frequently mentioned ones are the extraordinary nature of Ataturk, and his orientation towards action, as exemplified below:

> "*In Tripoli, Mustafa Kemal donned Arabic clothes and used the name 'Sharif, the Journalist'. He put into practice what he learned at the Academy of War and registered his first military achievements in Derna and Tobruk, against Italians." (p. 27)*

Table 2. Findings Regarding "The Steps Towards National Awakening and Independence" Domain of Learning

Category	**Codes/F**	**Total**	**Category**	**Codes/F**	**Total**
1. Strategic	1/5, 2/2, 4/6, 5/2, 7/11, 8/2, 9/2, 10/4, 11/5, 12/1, 14/4, 16/1, 17/1, 18/3, 20/1	50	6. Creative	2/6, 5/1, 6/5, 8/4, 9/3	19
2. Charismatic	1/10, 2/4, 3/3, 4/11, 5/1, 6/1	30	7. Democratic	6/1, 9/1, 10/1, 1/1, 12/1, 3/1, 19/1, 20/1, 22/1	9
3. Visionary	1/7, 2/1, 4/1, 5/3, 6/2, 7/5, 8/1, 9/3, 13/2, 14/3	26	8. Authentic	1/1, 2/2, 3/1	4
4. Transformative	1/14, 3/8, 4/2,	24	9. Spiritual	8/1	1
5. Entrepreneurial	**1/5, 2/7, 4/1, 6/9, 8/1, 10/1**	24			

According to Table 2, the analysis of *The Steps Towards National Awakening and Independence* domain of learning reveals references to 9 types of leadership, with Ataturk's Strategic, Charismatic, and Visionary leadership traits standing out, while the *Spiritual Leadership* was found to be the most rarely mentioned trait.
The most commonly emphasized examples of Strategic leadership behaviors in this domain of learning are "*7. Decision-making in tune with environmental conditions*", "*4. Having a significant and positive effect on others*", and "*11. Foresight for strategic change*". A quotation from the book, presenting Ataturk as a leader capable of decision-making in tune with environmental conditions is provided below:

> *"As the enemy continued its progress, he assumed responsibility and took direct leadership of part of his forces towards Kocaçimen Hill. When he reached Conkbayırı, he came across fleeing soldiers of the Turkish army. He boosted their morale, and with strong commanding skills, he managed to open up Arıburnu front (p. 38)*

The most commonly emphasized examples of Charismatic leadership behaviors are "*4. Determination"*, "*1. Extraordinariness and orientation towards action"* and "*2. High level of self-confidence*". An example of his determination is provided in the textbook through a quote from him: "*…As they have come, so they will go!" (p. 46).*

The third most frequently expressed type of leadership in this domain of learning is Visionary leadership. The most commonly emphasized examples of Visionary leadership behaviors are "*1. Reasoning, analysis, and effective strategic thinking*", "*7. Inclination to learning at all times*", "*8. Multi-dimensional perspective towards events*", and "*5. Ambitious and fighting spirit*". Among these, "*1. Reasoning, analysis, and effective strategic thinking*" is the most commonly expressed form of behavior in this context.

> *"Upon landing in Samsun, Mustafa Kemal immediately reviewed the state of the region. On May 22, he sent a telegram to the government, noting unjust landings by the British armed forces and calling for measures from the government. (p. 52).*

Table 3. Findings Regarding The "A National Epic: Independence or Death" Domain of Learning

Category	Codes/F	Total	Category	Codes /F	Total
1. Strategic	1/7, 2/1, 4/1, 5/3, 7/3, 6, 9/3, 10/1, 11/6, 12/1, 14/2, 16/3, 17/2, 18/4, 20/3, 21/2	48	8. Cultural	1/3, 2/2, 3/2, 4/2	9
2. Visionary	1/10, 2/2, 4/1, 5/4, 6/2, 7/5, 9/3, 13/6, 14/5	38	9. Servant	1/6, 2/2	8
3. Charismatic	1/8, 2/1, 3/6, 4/3, 6/7	25	10. Democratic	1/1, 8/1, 9/1, 10/1, 12/1, 19/1, 20/1, 21/1	8
4. Entrepreneurial	5/3, 6/3, 9/3, 10/14	23	11. Autocratic	3/2, 6/3, 11/2	7
5. Creative	1/1, 6/7, 7/1, 8/4, 9/6	19	12. Authentic	1/2, 3/2	4
6. Transformative	1/7, 2/1, 3/8, 4/1, 10/1	18	13. Transactional	1/1, 2/1, 3/1	3
7. Spiritual	2/1, 3/3, 4/2, 8/2, 10/4	12	14. Ethical	11/2	2

According to Table 3, the analysis of A National Epic: Independence or Death domain of learning reveals references to 14 out of 15 types of leadership, with Ataturk's Strategic, Visionary, and Charismatic leadership traits standing out, while the Ethical Leadership was found to be the most rarely mentioned trait.

The most commonly emphasized examples of Visionary Leadership behaviors in this domain of learning are "*1. Foresight*", "*8. Efficient management of human resources*", and "*11. Foresight for strategic change*". In the textbook, the most frequently mentioned behavior associated with this type of leadership is "*Foresight*", as shown in the following example:

> *"...He said to those present: Take a look at the calendar upon receiving the news for the start of the offensive. We will be in Izmir on the fifteenth day to follow. There were some who did not believe, with tongue in cheek... Upon his return from Izmir, he saw some people who were with him that night and said, 'Apparently, I was mistaken by one day. But it is not my fault. It is the enemy's!" (p.96)*

In this domain of learning, Visionary Leadership is found to be the second most frequently expressed type of leadership in the textbook, where this type of leadership is mostly exhibited through "*1. Reasoning, analysis, and effective strategic thinking*", "*13. Ability to express one's vision to his followers*", and "*7. Inclination for learning at all times*". In the textbook, the most frequently mentioned behavior associated with this type of leadership is "*Reasoning, analysis, and effective strategic thinking*":

> *"In total war, nations that are slow in dedicating all tangible and intangible resources to the defense of the homeland and which permit behaviors otherwise cannot be deemed to be really venturing forth towards war and struggle and to believe in success." (p. 89)*

The third most frequently expressed type of leadership is Charismatic leadership. In the textbook, the most frequently mentioned behaviors associated with this type of leadership are "*1. Extraordinariness and orientation towards action*", "*3. Appearing in extraordinary times, motivating and inspiring the followers*", and "*6. Taking risks*". Among these leadership behaviors, the most frequently mentioned one is "*Extraordinariness and his orientation towards action*", as exemplified below:

> *"Even though Mustafa Kemal was injured due to a fall from his horse, he still led the battle from the headquarters at the front. The Commander-in-Chief of Turkish armies, Mustafa Kemal issued his historical order on "total war" at the most crucial point of the struggle and turned the tides, once and for all against Greek." (p. 91)*

Table 4. Findings Regarding The "Kemalism and Modernizing Turkey" Learning of Domain

Category	Codes/F	Total	Category	Codes/F	Total
1. Visionary	1/13, 5/10, 6/1, 7/22, 8/1, 10/5, 13/13, 14/6, 8/1	72	8. Democratic	1/7, 4/1, 8/1, 9/1, 10/4, 12/1, 13/3, 14/2, 17/3, 21/2, 22/5	30
2. Transformative	1/35, 2/1, 3/19, 4/3, 7/1,11/2, 10/3	64	9. Servant	1/2, 2/11, 3/2, 4/3, 6/9	27

3. Strategic	1/3, 2/12, 4/1, 6/1, 9/2, 10/8, 11/3, 12/1, 14/3, 15/1, 16/1, 17/6, 18/5, 21/1, 20/2	50	10. Spiritual	1/2, 2/10, 3/3, 4/2, 8/3, 9/3, 10/1	24
4. Cultural	1/11, 2/5, 3/11, 4/13	40	11. Authentic	3/7, 4/1, 7/1, 12/1, 13/1	11
5. Entrepreneurial	2/3, 5/15, 6/7, 9/3, 10/7, 11/4	39	12. Ethical	3/2, 8/1, 9/1	4
6. Charismatic	1/6, 2/3, 3/11, 4/7, 5/6, 6/3	36	13. Transactional	3/4	4
7. Creative	1/1, 3/3, 4/2, 5/8, 6/14, 9/3	31	14. Liberal	11/1	1

According to Table 4, the analysis of the textbook "*Kemalism and Modernizing Turkey*" revealed that Visionary, Transformative, and Strategic leadership traits of Ataturk stood out. The least frequent examples of leadership behavior were those associated with Liberal/Laisses-faire Leadership.

The most commonly emphasized cases of Visionary Leadership behaviors stand out as "*7. Inclination to learning at all times and having a multi-dimensional perspective towards events*", "*1. Reasoning, analysis, and effective strategic thinking*", and "*13. Expressing one's vision to his followers*". In the textbook, the most frequently mentioned behavior associated with this type of leadership is "*inclination to learn at all times and having a multi-dimensional perspective towards events*", as shown in the following example:

> *"One year after its construction, in June 1930, as Ataturk visited the mansion, the staff there said the branch of the sycamore tree next to the building was scratching the roof of the mansion, damaging the roof and the wall, and thus the branch should be cut. Ataturk, instead, asked the mansion to be moved further, rather than cutting the branch of the tree." (p.148)*

In this domain of learning, transformative leadership is found to be the second most frequently expressed type of leadership in the textbook. The most commonly emphasized cases of transformative leadership behaviors in this content domain stand out as "*1. determination, building a shared vision*", "*3. predicting the flow of history with determination and confidence in his own assessment*", and "*4. raising awareness among people*". In the textbook, the most frequently mentioned behavior associated with this type of leadership is "determination and *building a shared vision,*" as shown in the following example:

> *"Opening up, expanding, and extending the well-preserved minds and heads of Turks. This is a duty of the Ministry of Culture. On the other hand, concepts of positive sciences and material elements of technique should be introduced to the heads of capable Turkish children, in theoretical form as well as through practical instruments." (p.138)*

Another form of leadership mentioned frequently in this section, Strategic Leadership, is expressed with references to "*2. Building an authentic vision*", "*10. Exhibiting distinct attitudes and behaviors to keep the organization working*", and "*17. Setting short- and long-term targets*" An example of "*building an authentic vision*" is provided as follows: *"Republic is a form of administration based on grand values and qualities of ethics. Republic is virtue." (p.122)*

Table 5. Findings Regarding The "Democratization Efforts" Domain of Learning

Category	Codes/F	Total
1. Visionary	1/8, 3/1, 7/5, 8/1, 9/1, 10/1, 11/1, 13/1	19
2. Democratic	1/3, 4/1, 10/3, 11/2, 14/5, 17/1	15
3. Creative	5/7, 6/6, 9/1,	14
4. Strategic	1/2, 2/1, 4/1, 5/1, 6/1, 8/1, 9/1, 10/1, 14/1, 17/1, 18/2	13
5. Transformative	1/3, 3/4, 4/2, 6/1/, 7/1, 10/1	12
6. Authentic	3/7, 4/4	11
7. Entrepreneurial	2/1, 5/3, 6/2, 10/2	8
8. Charismatic	1/1, 2/2, 4/4	7
9. Servant	1/3, 2/1, 3/2, 6/1	7
10. Ethical	3/3, 8/1, 9/1, 10/1	6
11. Liberal	11/1	1

According to Table 5, the "Democratization Efforts" section references 11 types of leadership, with Visionary, Democratic, and Creative leadership traits of Ataturk standing out. The most commonly emphasized cases of

Visionary leadership behaviors in this domain of learning stand out as "*1. Reasoning, analysis, and effective strategic thinking*" and "*7. Inclination to learning at all times and multi-dimensional perspective towards events*". In the textbook, the most frequently mentioned behavior associated with this type of leadership is "*Reasoning, analysis, and effective strategic thinking*".

The second most frequently expressed type of leadership is Democratic leadership. The most commonly emphasized cases of Democratic leadership behaviors in this section stand out as "*14. Delegating and sharing governing power with his subordinates"* and *"10. Prioritizing people."* An example of this type of leadership: *"Upon his election as President on October 29, 1923, Mustafa Kemal had the Prime Minister Ismet Pasha assume the position of party head as Mustafa Kemal's deputy." (p.169)*

The third most common type of leadership is Creative leadership. In the book, Creative leadership's most frequently mentioned expressions are "*5. Coming up with innovative solutions for problems"* and "*6. Analysis-synthesis ability*". An example of the most frequently mentioned behavior associated with this type of leadership is provided below:

> *"...Most recently, I stated my views on April 8, 1923, as nine principles. This program I printed and published at the time of the elections for the Second Grand National Assembly served as the basis of our party." (p. 168)*

Table 6. Findings Regarding "Turkish Foreign Policy During Ataturk Era" Domain of Learning

Category	Codes/F	Total
1. Strategic	1/2, 2/3, 7/2, 10/1, 14/2, 17/1, 18/6	17
2. Entrepreneurial	2/1, 6/3, 9/1, 10/6	11
3. Creative	1/1, 4/1, 6/6, 8/1, 9/2	11
3. Transformative	1/5, 3/3, 6/1	9
5. Visionary	1/6, 7/1	7
6. Servant	1/1, 2/4, 5/1	6
7. Authentic	3/4	4
8. Charismatic	1/1, 4/1, 5/1, 6/1	4
9. Ethical	3/1, 8/1, 10/1	3

According to Table 6, the analysis of the *"Turkish Foreign Policy during the Ataturk Era"* section revealed references to 9 out of 15 types of leadership covered, with Strategic, Entrepreneurial, and Creative leadership traits of Ataturk. The type of leadership that is most rarely mentioned is Ethical leadership.

The most commonly emphasized examples of Strategic leadership behaviors are "*18. Analysis at the local and global scale*", "*2. Developing an authentic vision*", and "*1. Foresight*". An example of behaviors presented in the book, as a case of "*Analysis at the local and global scale*", which is the most frequently mentioned behavior associated with this type of leadership, is as follows:

> "*Ataturk acted with a realistic vision regarding the prevailing conditions in the world and the nation, at the time of setting the borders of the new country to be established on the basis of the National Pact (Misak-ı Milli)…" (p. 182)*

The second most frequently expressed type of leadership in this domain of learning is Entrepreneurial leadership. This type of leadership is mostly associated with "*10. Strong foresight and the ability to analyze environmental variables well*" and "*6. Determination for realizing one's vision*". In that part of the book, the following is presented as an example of "*strong foresight*":

> "*...Non-muslim students educated in those schools were subjected to activities that injected nationalist awareness into them and led to minority revolts. Ataturk considered this objectionable for the future of the new Turkey." (p. 185)*

In this section, Creative leadership is found to be the third most frequently expressed type of leadership in the textbook. The most frequently mentioned expressions of Creative leadership in this content domain appear through the behaviors of "*6. Analysis-synthesis ability*" and "*9. Courage and determination*". An example of the "*Analysis-synthesis ability*" as provided in the book is as follows: "*Ataturk considered Lausanne Peace Treaty as 'a turning point for Turkish history'." (p. 184).*

Table 7. Findings Regarding The "Ataturk's Death and Afterwards" Domain of Learning

Category	Codes/F	Total	Category	Codes/F	Total

1. Strategic	1/1, 2/2, 4/3, 6/4, 8/3, 10/7	20	6. Charismatic	1/1, 2/1, 3/1, 4/2, 5/2, 6/2	10
2. Creative	1/1, 4/6, 6/6, 8/1, 9/3	17	7. Authentic	3/6, 11/1	7
3. Servant	2/4, 3/2, 4/3, 5/4, 6/2,	15	8. Spiritual	2/1, 8/4, 10/1	6
4. Entrepreneurial	2/2, 5/4, 6/2, 10/7	15	9. Cultural	1/1, 3/1, 4/3	5
5. Transformative	1/3, 3/6, 4/2, 5/1, 9/2, 10/1	15	10. Democratic	1/2, 9/3	5

According to Table 7, the analysis of the textbook in terms of the "*Ataturk's Death and Afterwards"* domain of learning revealed references to 10 types of leadership covered, with Strategic, Creative, and Servant leadership traits of Ataturk standing out. The least frequent examples of leadership behavior in this content domain were those associated with Cultural and Liberal / Laisses-faire Leadership.The most commonly emphasized examples of Strategic leadership behaviors in this domain of learning are "*10. Exhibiting distinct attitudes and behaviors to keep the organization working*", "*6. having an investigative mind and continuous development*", and "*4. Having a significant and positive effect on others*". An example of this type of leadership provided in the book is as follows:

> *"Some works of Ataturk are on education. He created the book 'Civil Knowledge' to raise awareness among the individuals comprising society on the issue of citizenship. The book was published with Afet Inan as the author and is comprised of two parts. Subsequently, it was used as a textbook." (p. 196)*

Creative leadership is found to be the second most frequently expressed type of leadership in the textbook. The most frequent examples of leadership types are "*4. Devoting himself to his work*", "*6. Analysis-synthesis ability*", and "*9. Courage and determination*". An example of "*devoting himself to his work*" behavior is provided in the textbook as follows:

> *"In his address to the nation in the Tenth Year Address, Ataturk said, 'We achieved so many great things in so little time.' And the grandest of these, the one based on Turkish heroism and high Turkish culture, is the Republic of Turkey." (p. 196)*

The third most frequently expressed type of leadership is Servant Leadership. The most commonly emphasized cases of this type of leadership behavior in this section stand out as "*2. Identifying the needs of society and trying to meet them*", "*5. Trust, reliability, and self-sacrifice*", and "*4. Endless devotion for work and service perspective*." Among these, "*2. Identifying the needs of society and trying to meet them*" is the most commonly expressed form of behavior in this context:

> *"Ataturk took part in many bloody battles on many fronts, engaged in diplomatic struggles, introduced one revolution after another to ensure the modernization of the nation he gave independence to, and in the end, established a new state with a respectable place in the world." (p. 194)*

Conclusion and Discussion

Throughout the whole book, it is evident that Ataturk's Strategic (242), Visionary (208), Transformative (160), Charismatic (141), Entrepreneurial and Creative (128) leadership traits stand out. It is also evident that Ataturk exhibited Democratic (75), Servant (58), Cultural (56), Authentic (50), Spiritual (43), Ethical (17), Interactive (9), Autocratic (7) and Liberal/Laissez-faire (2) leadership types as well. The prominence of Ataturk's Strategic, Visionary and Transformative leadership traits in the textbook is arguably due to his military background, the challenges of the era, and his idealistic, freedom-loving, and fighting spirit. Indeed, other studies on the leadership and personality traits of Ataturk also emphasize these traits (Akarslan, 2021; Aktaş, Türk-Aktaş & Erol 2015; Aslan, 2008; Baykal, 2002; Dinler, 2018; Eraslan, 2006; Erdenir, 2008; Kırel, 2001; Köse, 2021; Taş, 2009; Tekeli, 2018).

The analysis of individual domains of learning reveals that the 3rd and 4th domains of learning are notable for increased expression of other leadership traits. This is probably due to the fact that these content domains cover higher numbers of learning outcomes associated with the curriculum and therefore have comparatively intense content. On the other hand, the coverage of the conditions leading to Ataturk's rise as a commander in the 3rd domain of learning and the coverage of topics and texts related to Ataturk's steps as a leader towards the modernization of the Republic of Turkey in the 4th domain of learning must have led to a greater emphasis on Ataturk's leadership traits.

Another result reached in the analysis of individual domains of learning is that the 2nd and 6th domains of learning refer to a lower number of leadership types. A glance at these domains of learning reveals that the second unit came to emphasize the same leadership types due to the repetition of the topics covered, even though the number of learning outcomes and topics to be covered in the curriculum was higher. The lower number of learning outcomes and the smaller scale of the topics covered, along with the repeating topics, can account for the repetition of the same leadership types in the 6th domain of learning.

"The Birth of a Hero" domain of learning is found to emphasize Visionary, Strategic, Charismatic, Visionary, and Creative leadership traits more. Among the visionary leadership traits frequently emphasized, "inclination to learn at all times" and "having a multi-dimensional perspective towards events" draw attention. This is due to the fact that this content domain covers Ataturk's youth and education. In this sense, Ataturk's presentation as a role model in the textbook is deemed crucial for generating a will to learn and facilitating a multi-dimensional perspective towards events among the youth. Indeed, as other studies covering the education of Ataturk (Aydemir, 1963; Bursalıoğlu, 1983; Doğramacı, 1985) noted, from his childhood to his years serving as a national leader, he always had the inclination to learn and had always emphasized the importance of education in order to facilitate the modernization of Turkish society. The same domain of learning also underlines Ataturk's strategic leadership qualities with reference to his "decision-making in tune with environmental conditions" and "foresight". Kılıç-Özkaynar (2017) and Vahapoğlu (2019) stated that, taking into account the prevailing conditions in times of struggle, Ataturk took decisions and steps to quickly bring results. As Ataturk had a keen eye on and ear for the developments taking place around him during his childhood and youth, he was able to come up with a strong analysis of these events and decide accordingly for the steps to be taken in the future; hence the behavior types emphasized in this content domain.

The domain of learning "The Steps Towards National Awakening and Independence" has a marked emphasis on Strategic, Charismatic, and Visionary leadership traits. In this context, strategic leadership is expressed mostly through "decision-making in tune with environmental conditions" and "foresight for strategic change". This, arguably, is a result of Ataturk's appearance as a leader in the circumstances prevailing in the world and the Ottoman Empire and the important decisions he took with respect to the future of the Turkish nation. Charismatic leadership, in turn, is expressed through "determination", and "orientation towards action". Indeed, studies by Aşkun (1998), Bursalıoğlu (1983), Özbudun (1986), and Vahapoğlu (1998) also expressed that Ataturk stood out as a leader in the events in which he came to be involved, with reference to his orientation towards action. Aslan (2008), Atay (1999), Aydemir (1963), Cora (2016), Eraslan (2006), Geçikli (2012), Kongar (2012), Taş (2009), Tekeli (2018), Tural (1999), Tünay (1985), Yüksel, and Açıkgöz (2020), on the other hand, state that Ataturk is determined and consistent in his attitudes and behavior towards events as a leader. The comparatively lower emphasis on Authentic and Spiritual leadership types is probably due to the fact that Ataturk appeared on the leadership scene as a military leader rather than a political one.

"A National Epic: Independence or Death" domain of learning, in turn, emphasizes mostly Ataturk's Strategic, Visionary, Charismatic, Entrepreneurial, and Creative leadership traits. Among the strategic leadership traits underlined, "foresight for strategic change" draws attention. This, arguably, is due to the fact that this domain of learning tells how Ataturk appeared as a leader in a time of national struggle for the Turkish nation, how he assumed responsibility, and how he took decisions to determine the fate of the nation. In this sense, the appearance of a leader in extraordinary times, taking the nation to independence through national unity and solidarity, serves as an example to provide the students with an awareness of nationhood and responsibility (T.C. İnkılap Tarihi ve Atatürkçülük Öğretim Programı, 2018). This domain of learning also contains significant references to "expressing his vision to his followers" as part of Ataturk's leadership vision. It is possible to associate this finding with Ataturk's ability to come up with an accurate analysis of the conditions in times of national struggle, make the correct decisions, and explain his vision to his followers while doing so (Bursalıoğlu, 1983). On the other hand, Ataturk commanding all authority with the Commander-in-Chief law, as covered by this domain of learning, is the reason why autocratic leadership traits are also expressed on these pages. That is why, in contrast to other sections, Ataturk's autocratic leadership traits such as "achieving effective and positive results in a short time", "discipline and respect for authority", and "decision-making and management authority" are expressed in this domain of learning. Indeed, Arıkan (2001), in another study on Ataturk's leadership traits, noted that he did not shy away from authoritarian action when necessary for the good of the country. Ataturk's Ethical leadership is also much less expressed in this domain of learning. Ethical leadership stands out in the form of "focusing on the organization's success rather than personal ego". Limited references to this type of leadership in this domain of learning are due to the prevalence of the Autocratic leadership trait in this time frame, as Ataturk embraced full authority through the Commander-in-Chief law, even though his focus in doing so was to achieve the success of the nation (Aslan, 2008)

Visionary, Transformative, Strategic, and Cultural leadership types are more common in the "Kemalism and Modernizing Turkey" domain of learning. Among the visionary leadership traits frequently emphasized in this domain of learning, "inclination to learn at all times and multi-dimensional perspective towards events" as well as "reasoning, analysis, and effective strategic thinking" are the most common. Özlü (2011) and Tural (1999) explain this by explaining how Ataturk, as a head of state, took necessary steps to facilitate the modernization of Turkey and the Turkish nation, engaged in continuous development of himself while doing so, and thereby convinced his followers of the need for revolutions. The second most common leadership type in this domain of learning, transformative leadership, often appeared in the form of "determination in building a shared vision" and "predicting the flow of history while maintaining confidence in his own assessment." This is associated with Ataturk's prominence as a leader in the era of the revolutions and with his efforts to build a shared vision for the changes. Indeed, Aslan (2008), Eraslan (2006), and Taş (2009) emphasized Ataturk's efforts to build a shared vision both during the National Struggle and after the declaration of the Republic. On the other hand, Ataturk's Liberal leadership is much less frequently expressed in this domain of learning. Kongar (1984) underlined liberal leadership as one type of leadership Ataturk never utilized or had a preference for and noted that laissez-faire was simply not in his book.

Visionary, Democratic, Creative, Strategic, Transformative, and Authentic leadership skills were noted frequently in the "Democratization Efforts" domain of learning. Among the visionary leadership traits frequently emphasized in this domain of learning, "inclination to learn at all times and multi-dimensional perspective towards events" as well as "reasoning, analysis, and effective strategic thinking" stood out. The prominence of these leadership traits in this domain of learning is due to how Ataturk, as a head of state, took necessary steps to facilitate the democratization of Turkey and the Turkish nation, engaged in continuous development of himself while doing so, and thereby convinced his followers of the need for democracy. In this context, Kolburan and Tasa (2017) underlined the analysis and synthesis skills of Ataturk, while Aydemir (1963), Ertan (2016), and Kırel (2001) noted how he has been open to learning throughout his life. As Aydemir (2004) stated, Atatürk's tendency to research and teach Turkish history and civilization in particular supports this feature. This domain of learning also has abundant examples of Ataturk's democratic leadership, in the forms of "sharing governing power with his subordinates", "encouraging participation and delegation,", and "democracy and prioritizing people". These behaviors are the result of Ataturk's efforts to democratize the Turkish nation and plant democracy's roots throughout the country. Other studies on the personal characteristics of Ataturk (Arıkan 2001; Erendil, 1986; Dinler, 2018; Dönmezer, 1991; Köse, 2021; Özbudun, 1986; Uzun, 2009; Yüksel and Açıkgöz, 2010) also discussed his democracy perspective, and efforts to bring in a democratic identity in the Turkish nation.

Strategic, Entrepreneurial, Creative, and Transformative leadership types are observed frequently in the "Turkish Foreign Policy during the Ataturk Era" content domain. Among the traits of strategic leadership most frequently emphasized in this content domain are "analysis at the local and global scale" and "building an authentic vision". This is arguably a result of Ataturk's strong analysis of the problems in Turkey and the wider world, so as to provide informed guidance for Turkish foreign policy (Aslan, 2008; Dinler, 2018; Eraslan, 2006; Kırel, 2001; Taş, 2009; Tekeli, 2018). "Strong foresight and the ability to analyze environmental variables well" and "Determination for realizing one's vision" are the traits attributed to Ataturk in this domain of learning as expressions of his Entrepreneurial leadership. Aydemir (2004), Murat (2016), and Tünay (1985) drew attention to Ataturk's ability to come up with a robust analysis of the environmental factors and to build strong foresight on the basis of such an analysis. On the other hand, Atay (1999), in his book Çankaya emphasizes that he has foresight when talking about the decisions taken by Atatürk. In this domain of learning, the least frequently mentioned type of leadership is Ethical leadership, which is expressed through behavior traits such as "cherishing followers and taking fair and egalitarian decisions", "taking ethical values into account in any endeavor", and "honesty and reliability". Thus, Ataturk's fair decisions as well as his focus on ethical values in his endeavors are expressed in the textbook to present him as a model for the students, who are expected to develop these characteristics. Cora (2016) and Kırel (2001) also underlined Ataturk's honest and reliable side.

The domain of learning "Ataturk's Death and Afterwards" was found to emphasize mostly his Strategic, Creative, Servant, Entrepreneurial, and Transformative leadership traits. Strategic leadership, as emphasized frequently in this domain of learning, is mostly expressed through "exhibiting distinct attitudes and behaviors to keep the organization working" and "having an investigative mind and continuous development". Even though this domain of learning also covers the years of World War II and Turkey's transition into multi-party democracy following the death of Ataturk, it is understood that policies put in place during the Ataturk era were kept in place. As a result, "the ability to keep the organization going" and "continuous self-improvement," as expressed during the life of Ataturk, continued to appear in this domain of learning as examples of Strategic leadership. In this framework, the domain of learning draws attention to Ataturk's Creative leadership traits in

the form of "devoting himself to his work" and "analysis-synthesis ability". Eraslan (2006), Kırel (200), and Tekeli (2018) argue that Ataturk has been embraced as a model for Turkish policymakers even after his death due to his creative insights. On the other hand, with respect to Cultural leadership, Ataturk's most frequently expressed traits are "preserving and maintaining existing culture".

Throughout the textbook, all content domains contain references to Ataturk's Strategic, Visionary, Charismatic, Transformative, Creative, Authentic, and Entrepreneurial leadership styles, whereas Democratic, Servant, Cultural, Transactional, and Spiritual leadership styles are not present in all domains of learning. Furthermore, expressions of Ataturk's Liberal leadership style were present only once in the 4th and 5th domains of learning, making it the least frequently expressed type of leadership among all. Even though Ataturk exhibited democratic leadership characteristics throughout his life, he is also understood to veer into autocratic leadership when the needs of the country require it, as attested in the 3rd content domain.

In this study, Ataturk's leadership traits' are expressed in the history of the Turkish Revolution and The findings lead to the following recommendations:

- New learning outcomes to underline Ataturk's leadership traits can be introduced into the History of the Turkish Revolution and Kemalism curriculum.
- The number of examples and activities in the textbook exhibiting Ataturk's leadership traits can be increased.

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Author (s) Contribution Rate

The authors contributed equally to this study.

Conflicts of Interest

There are no conflicts of interest regarding the publication of this paper.

Ethical Approval

Since this study was a document review, it was not necessary to obtain ethics committee approval.

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The Effect of an Argumentation-Based Inquiry Approach on Students' Academic Achievement and Analytical Thinking Skills

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The Effect of an Argumentation-Based Inquiry Approach on Students' Academic Achievement and Analytical Thinking Skills

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Abstract

This study aimed to investigate the effects of the argumentation-based inquiry (ABI) approach on the analytical thinking skills and academic achievement of seventh-grade students using a mixed method. It was conducted in a secondary school in the Western Black Sea region of Turkey with seventh-grade students from two classes during the fall semester of the 2021–2022 academic year. Unit-based achievement tests, analytical thinking scenarios, and semi-structured interviews were used as data collection tools. The findings show that the application of the ABI approach in science classes is effective in improving the academic achievement of students. According to the analytical thinking test findings, a significant difference was found in favor of the experimental group in the post-test. The evaluation of the quantitative and qualitative findings revealed that the ABI approach used in science lessons had improved the analytical thinking skills of the experimental group students.

Keywords: ABI, Argumentation, Analytical thinking skills, Inquiry, Science education

Introduction

Today, interest in 21st-century skills is increasing. These high-level skills, which make it possible to adapt to the era we live in, are also very important for our lives. High-level thinking includes detailing any given material, making inferences, discovering the statements behind the given, making meaningful representations, analyzing existing relationships, and establishing relationships between parts (Resnick, 1987). In short, the thinking skills that an individual uses when deciding what to believe and do are defined as higher-order thinking skills (Ennis, 1985).

Higher-order thinking skills include many cognitive activities such as reasoning, reaching a judgment, struggling with uncertainty, flexible thinking, and being open-minded (Çakır, 2013). The individual uses higher-order thinking skills while deciding what to do or what to believe (Ennis, 1985). Skills such as analytical thinking, critical thinking, problem solving, and decision-making are among the high-level thinking skills that are effective in gaining 21st century skills (Ezberci Çevik, 2021). Among these skills, analytical thinking has a very important place (Amer, 2005). Analytical thinking is a life skill that is very important to develop considering the learning process (Ramdiah, Mayasari, Husamah, & Fauzi, 2018).

Analytical thinking is generally defined as being able to examine an object, story, event, or situation from different aspects, breaking it down into meaningful parts, identifying the relationships between these parts, classifying them, and determining cause-and-effect relationships (Bloom, 1956). Looking at the expressions in the basic definitions in the literature, analytical thinking means being able to separate a whole into its parts or elements, to be able to determine the relations between parts, to deal with the whole in different aspects, to classify the given or obtained information according to various criteria, to distinguish the relevant or important among the given or obtained information, to organize the information within a certain logic, to be able to compare and contrast two or more things, to evaluate the characteristics of something, criticize, generalize and customize, determine the main view on which the existing claim is based, identify the side ideas that support the main idea and evaluate its accuracy, assumptions, their bias, an unspecified point of view, being able to identify bias or intent, inference, making sense, to make a judgment, being able to choose the right one for solving a

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problem, being able to make an effective evaluation is defined as being able to evaluate the reasoning (Akkuş & Senemoğlu , 2021).

Analytical thinking skills have a very important place in education. Education aims to enable individuals to access correct information by using scientific processes correctly and to use this information effectively. The scientific process can simply be defined as individuals' observing, defining, and testing the events they describe (Carey, 2011). Analytical thinking is a necessary way of thinking so that individuals can make relevant observations, reveal the relationships between the parts, and understand the role of each part in the whole (Sartika, 2018). Providing students with analytical thinking skills in the educational environment contributes to students becoming good problem solvers, decision makers, and individuals with lifelong learning skills (Schwab & Samans, 2016).

The main way to increase analytical thinking skills in science classes is through the development of inquiry skills (Ocak & Akkaş Baysal, 2021). It enables individuals to develop explanations for these questions by being directed to questions that have a scientific focus in inquiry and to formulate these explanations after collecting evidence to defend their explanations (National Research Council (NRC), 2000, p. 19). Individuals who have gained research-inquiry skills effectively use some high-level skills such as analysis, synthesis, and evaluation in this process (Ocak & Akkaş Baysal, 2021). Therefore, analytical thinking skills are closely related to the concept of inquiry. In addition, in science classes where research and inquiry-based applications take place, students have the opportunity to discover new information like scientists by being included in the learning process (Hand, 2008). The purpose of inquiry in science education is to provide correct preliminary information and effective learning environments, enabling individuals to assimilate and construct information (Kabataş Memiş & Çakan Akkaş, 2016).

One of the research-inquiry-based applications is argumentation. Argumentation, which is based on inquiry, includes the process of making claims about a situation, supporting or refuting claims with evidence, and establishing logical relationships between events and ideas (Duschl & Osborne, 2002). Osborne, Henderson, MacPherson, Szu, Wild, and Yao (2016) stated that argumentation is a central feature of science.

While learning science, students should be given the opportunity to learn about science concepts as well as gain insight into the epistemology of science, its applications and methods, and its nature as a social practice through science studies (Newton et al., 2000). In this respect, argumentation applications and pedagogies that encourage argumentation, which are of central importance for both education and science, also form the basis of an effective education in science (Newton et al., 1999). Since the argumentation-based science learning approach, by its nature, involves students' thinking, creating reasons, and collecting evidence for these reasons, students' ability to identify the relationship between claims and justifications, evaluate justifications, and analyze by presenting evidence has the potential to develop analytical thinking skills. In this context, it is thought that students' analytical thinking skills will develop in science classes where the ABI approach is applied. Therefore, in this study, it is aimed at improving the academic achievement and analytical thinking skills of students by using the ABI (Argumentation-Based Science Learning) approach.

Theoretical Framework

Analytical Thinking

Analytical thinking is defined as handling any object or event with different aspects, separating it into parts, detecting relations between parts, classifying, determining cause-and-effect relationships, understanding the reason for established relationships, and associating with each other (Bloom, 1956). Analytical thinking is a powerful thinking tool that can be used to understand the parts of a situation (Amer, 2005). Elder and Paul (2019) stated the basic stages of analytical thinking as follows to guide individuals' effective analytical thinking: thinking about the purpose, defining or stating the question, collecting information, checking inferences, checking assumptions, explaining concepts, being aware of personal perspective, and thinking about results.
Analytical thinking skills have a very important place in science education. One of the most important courses in which analytical thinking skills can be developed is science. Through this course, individuals with analytical thinking skills should be involved in every sense of society, and this understanding should be adopted in all courses together with the science course (Bozkurt, 2022). In this context, analytical thinking as one of the life skills that should be taught to students in the science curriculum has taken its place in the science curriculum as of 2013 and has been clearly stated in the curriculum that entered into force in 2018 (MNE, 2013, 2018, p. 9). It is very important that students gain analytical thinking skills, which are seen to be more popular in our country with their inclusion in the curriculum (Bozkurt, 2022).

Argumentation-Based Science Learning (ABI) Approach

Hand and Keys (1999) developed the ABI (original name: Science Writing Heuristic) approach in order to define the structure of scientific arguments in education and to develop them in education. ABI guides teachers and students in thinking and writing while encouraging thinking, understanding, discussion, and writing on a series of activities done in the science laboratory (Hand et al., 2004).
The ABI approach is frequently used in science classes as an inquiry- and writing-based approach (Sönmez et al., 2021). ABI is an inquiry-based approach that enables students to actively engage in conceptual learning by conducting research in a laboratory environment (Hand, 2008). ABI is a tool for both teachers and students to think in more detail and to construct knowledge by questioning. To ensure the effective use of this tool in the classroom, Hand and Keys (1999) developed separate templates for teachers and students (see Table 1). The teacher template, which consists of some suggested activities that address students' meaningful thinking, writing, reading, and discussion skills, offers the teacher the opportunity to develop different activities in the process (Sönmez et al., 2021). The student template helps students systematize their explanations in the process of asking questions, linking claims with evidence (Hand & Keys, 1999).

Table 1. ABI teacher and student template (Hand and Keys, 1999)

ABI part I: a template for teacher-designed activities to promote laboratory Understanding	ABI Part II: A Template for Students
1. Exploration of pre-instructional understanding through individual or group concept-mapping	1. Beginning ideas: What are my questions?
2. Pre-laboratory activities, including informal writing, making observations, brainstorming and posing questions	2. Tests: What did I do?
3. Participation in scientific activities	3. Observations: What did I see?
4. Negotiation phase I: writing personal accounts of scientific activity (e.g., writing journals)	4. Claims: What can I claim?
5. Negotiation phase II: sharing and comparing data interpretations in small groups (e.g., making a group chart)	5. Evidence: How do I know? Why am I making these claims?
6. Negotiation phase III: comparing scientific ideas to textbooks or other printed resources (e.g., writing group notes in response to focus questions)	6. Reading: How do I compare my ideas with those of others?
7. Negotiation phase IV: individual reflection and writing (e.g., a presentation to a larger audience)	7. Refection: How have my ideas changed?
8. Exploration of post-instructional understanding through concept-mapping	

It is important that teachers create a learning environment suitable for the ABI approach in science lessons. Because unlike the traditional approach, in ABI, the student is at the center of the learning process. Thus, the role of the teacher in the lesson moves away from the center and changes into the learner position with the student in the process (Hand, 2008).

The aim of the ABI approach is to involve the student in the learning process as much as possible. Contrary to the traditional approach throughout the process, the student actively constructs knowledge (Çakan Akkaş, 2017). From this point of view, this study is aimed at improving the academic achievement and analytical thinking skills of students studying in science classes based on the ABI approach. The research questions are given below:

1. Is there a difference between the academic success of students studying in science courses based on the ABI approach and the academic success of students attending science courses based on the traditional approach?
2. Is there a difference between the analytical thinking skills of the students studying in science courses based on the ABI approach and the analytical thinking skills of students attending science courses based on the traditional approach?
3. What are the students' views on the application of the ABI approach in science classes?

4. Is there a correlation between the analytical thinking skills and academic success of the students studying in science courses based on the ABI approach?

Method

Design

In this study, a mixed-methods approach, which includes both qualitative and quantitative approaches, was used. Mixed methods research is a research approach in which the researcher's quantitative and qualitative data or techniques are combined or mixed in a single study or series of closely related studies (Christensen et al., 2020). The mixed-methods researcher chooses a pattern that reflects interaction, priority, timing, and incorporation at the decision stage (Creswell & Plano Clark, 2020). In this study, a nested mixed method design was used in terms of suitability for the purpose. The nested mixed pattern is a large pattern that allows data to be gathered together in qualitative and quantitative patterns (Mazlum et al., 2017). The quantitative aspect of this research is based on a quasi-experimental design with a pretest-posttest control group. The qualitative aspect is based on the case study, which includes semi-structured interviews with students at the beginning and end of the process.

Participants

The study was carried out in the fall semester of the 2021–2022 academic year with two different 7th graders studying with a teacher in a boarding primary school affiliated with the National Education System in the Western Black Sea Region. A total of 29 students (11 girls and 18 boys) participated in the study, including 17 students (5 girls and 12 boys) from the control group and 12 students (6 girls and 6 boys) from the experimental group. The environment of the school where the students study, and therefore the students, is at a low level of economic income. The majority of the students participating in the study come from the surrounding villages. One of the 7th graders constituting the participants was randomly determined as the control group and the other as the experimental group for the ABI application.

Procedure

The study was carried out within the scope of a science course at a boarding school in the Western Black Sea region in the fall semester of the 2021–2022 academic year. The study was carried out during a 6-week course in the units of force and energy. Two branches, an experimental and a control group, were determined for the study. Before the application, an academic achievement pre-test and an analytical thinking skills pre-test were applied to both the experimental group and the control group.

Students in the application group have done six ABI activities (I am interpreting the table; mass or weight; is it work or not; solving the mystery of Kinpot; designing a ship or airplane; where is air resistance) in their science lessons. For each activity, ABI students reported their activities individually using the template. During the application, the materials that were thought to be used by the students in their experiments were provided by the researcher.

The control group students expressed the traditional approach: they studied in an environment where the teacher is the narrator and gives the information directly, the student is the listener, the teacher answers questions from time to time, the subject is followed from the textbook, and the end-of-chapter questions are solved as an individual activity. The control group students did not do any activities individually or as a group.

Data Collection Tools and Data Analysis

A unit-based achievement test, scenarios prepared for analytical thinking skills, and semi-structured interviews with students were used as data collection tools.

Unit-based achievement test

The unit-based achievement test consists of a total of 24 questions: 20 multiple-choice and 4 open-ended questions prepared for the Force and Energy unit. Multiple-choice questions were prepared by the researcher by using the outcome assessment tests prepared by the Ministry of National Education and questions appropriate to the subject of the study from the question banks at the grade level. Open-ended questions were prepared to measure the concepts that students learned about the unit in depth. The prepared test was evaluated for internal

reliability and validity by four experts in the field. With this evaluation, it was taken into account that the questions in the test should be clear so that the students could understand and serve their purpose, that the visuals should be suitable for the knowledge in the subject area, and that they should be aimed at the targeted acquisitions in the 7th grade science curriculum. At the end of the examination, the changes requested by the experts were made. After the evaluations, a reliability analysis was performed, and a question that greatly reduced the reliability was removed from the test. The final Cronbach's alpha reliability coefficient was determined to be 0.724.

40 minutes for students to answer the test at the given time. There are two types of questions in the test: multiple-choice questions and open-ended questions. Separate scoring keys were used for multiple-choice questions and open-ended questions. The answer key for all questions was prepared by the researcher. In scoring the questions, a teacher was asked to evaluate the answers of three different students for the reliability of the scoring. At the end of the evaluation, it was determined that no errors were found. In order to determine whether there is a significant difference between the scores obtained before the study and the scores after the application, a pre-test-post-test application was carried out.

First of all, it was determined that the data obtained from the unit-based achievement test did not show a normal distribution in the normality tests. The non-parametric Mann-Whitney U test, which can be an alternative to the t-test for unrelated samples, is applied in cases where the data do not show a normal distribution, the number of data is low, and the data are not at least on the interval scale (Can, 2020). For this reason, the Mann Whitney U test was used to determine whether there was a difference between the students' academic achievement pre-test and post-test scores in terms of groups.

Analytical thinking skill scenarios

The development process of the analytical thinking skill test started with a literature review. Existing analytical thinking skills tests were examined, but a test that could be applied to secondary school students could not be determined. In this context, the scenarios developed by Çakır (2013) were used in the measurement of analytical thinking skills, and within the scope of this study, scenarios at the secondary school level were prepared. In these scenarios, students were asked to analyze information, comments, and/or inferences in a given text. Moreover, they were expected to discuss the extent to which the defended idea was logical and to express their own ideas by providing grounds rather than summarizing the information in the text.

After the scenarios were prepared, two faculty members working on the measurement of analytical thinking skills and experts in their fields were asked to evaluate them for reliability and validity. In line with the feedback from the experts, corrections (spelling errors and mistakes in sentence structures, correct reflection of possible alternative thoughts) were reviewed, and errors were corrected. In addition, the logical errors in the texts were revised in line with the expert opinion and revised twice by the experts. In the scenarios, the students were asked not to examine how the discussions in the given text were developed, the cause-and-effect relationships, the connections between the discussions, whether the given examples supported the discussion, or if there were any inconsistencies or logical errors. They were given 50 minutes to write an essay expressing their views. In order to measure analytical thinking skills, three scenarios have been developed that consider that lightning can strike the same place twice, bats are not blind, and when worms are divided into two, two new worms do not form. While choosing the topics selected in the scenarios, the topics that contain inconsistencies, logical errors, and people's knowledge and beliefs that are weak in terms of scientific basis were chosen. The reason for choosing such topics is to determine whether the student can correctly evaluate the discussion given in the text by using analytical thinking skills. A short excerpt from the analytical thinking scenarios is given below.

There are also different beliefs about lightning among the people. The most well-known of these is the idea that a lightning bolt will not strike the same place twice. Because people believe in this idea, they easily use areas that have been struck by lightning before. This is why people choose open and flat areas for picnics. A team of physicists at the international level collected and analyzed data on many lightning events and observed that lightning strikes in different ways according to their loads, leaving distinctive traces and even falling on the same place several times.

Then, the pilot application of the scenarios was carried out. For this application, two students were asked to explain what they understood from the scenarios, and whether the scenarios were understood correctly or not was evaluated with the help of the students. As a result of the reliability analysis performed to determine the reliability of the scale, the Cronbach alpha coefficient was determined to be 0.874. After the scenarios took their final form, they were applied before and after the implementation.

The Analytical Thinking Skill Rating Key prepared by Çakır (2013) was used in the analysis of the data obtained from the analytical thinking skill scenarios. It was taken into account how clearly the students expressed the main idea in the compositions they wrote, how they developed and organized their ideas, presented the supporting ideas, and whether they concluded the analysis by evaluating them effectively. The data were scored in accordance with the scoring key. The scoring keys are given below.

	3	2	1	0
Identifying the Main Idea	Expressed fully and completely	Partially expressed	Very poorly expressed	Misrepresented
Revealing relationships between main ideas and side ideas	Expressed fully and completely	Expressed fully and completely	Very poorly expressed	Misrepresented
Find principles for combining elements	Expressed fully and completely	Expressed fully and completely	Very poorly expressed	Misrepresented
Come to a conclusion	Expressed fully and completely	Expressed fully and completely	Very poorly expressed	Misrepresented

It was determined that the data obtained from the analytical thinking test did not exhibit a normal distribution in the normality tests. The non-parametric Mann-Whitney U test, which can be an alternative to the t-test for unrelated samples, is applied in cases where the data do not show a normal distribution, the number of data is low, and the data are not at least on the interval scale (Can, 2020). For this reason, the data obtained from the analytical thinking pre-test and post-test were analyzed with the Mann-Whitney U test.

Semi-structured Interviews

Within the scope of this research, semi-structured interviews were conducted with the 7th grade students in order to examine the students' perceptions of the science lesson and their analytical thinking skills. A total of two interviews were conducted, at the beginning and at the end of the study.

Questions were prepared for the purposes specified by the researcher. During the preparation process of the questions, the literature was searched, the interview questions about analytical thinking and the ABI process were examined, and care was taken to prepare questions that could reveal both situations and the relationship between them. After the interview questions were prepared, a pilot application was made to evaluate the clarity of the questions and their suitability for the purpose, and then the necessary corrections were made. After the pilot application, the questions that were difficult for the students to understand were simplified and made more understandable. At the beginning of the study, preliminary interviews were conducted in order to determine the perceptions of the students towards the science lesson and their analytical thinking skills before the applications. After the implementations, final interviews were held and audio recordings were made in order to get the opinions of both groups on the process and to reveal the effect of the process on their analytical thinking. At the end of the study, interviews were conducted with a total of six students: three from the experimental group and three from the control group.

Experimental group students were coded as SE1, SE2, and SE3, and control group students were coded as SC1, SC2, and SC3. The recorded interview data were transcribed by the researcher and converted into written documents. Then, the written data was read repeatedly, and a new code was created for each different situation encountered. After the researcher completed the coding process, the reliability and validity of the codes were evaluated by an expert. After the coding process, categories and themes were created based on these categories. Thematic analysis was used for data analysis. The analysis process has an inductive point of view.

Results and Discussion

Quantitative Findings

Findings from the unit-based achievement test

Pretest findings

According to the results of the Mann Whitney U test, which was conducted to determine whether there was a difference in the academic achievement pre-test scores of the students in terms of the groups, no significant difference was observed between the experimental group and the control group (U=100.500, p>0.05). That is, the groups are equivalent at the start of the application. The results of the analysis are given below.

Table 2**.** Unit-Based Achievement Pre-Test Analysis Results

Group	N	Rank Average	Sum of rank	U	p
Experiment	12	15,13	181,50	100,500	0,947
Control	17	14,91	253,50		

Post-test findings

According to the results of the Mann Whitney U test, which was conducted to reveal whether there was a difference in the academic achievement post-test scores of the students in terms of the groups, it was determined that there was a statistically significant difference (U=33.500, p< 0.05) between the experimental group and the control group in favor of the experimental group. The results of the analysis are given below.

Table 3. Unit-Based Achievement Post-Test Analysis Results

Group	N	Rank Average	Sum of Rank	U	P
Experiment	12	20,71	248,50	33,500	0.002
Control	17	10,97	186,50		

Findings from the analytical thinking skill test

Pretest findings

The p value obtained from the Mann-Whitney U test, which was conducted to determine whether there was a significant difference between the pre-test scores of the experimental and control groups, was determined to be 0.162. There was no significant difference between the pre-test average of the experimental group and the analytical thinking skill test scores of the control group (U=71, p>0.05). The analysis results are given in the table below.

Table 4. Analytical Thinking Skill: Pre-Test Analysis Results

Group	N	Rank Average	Sum of Rank	U	P
Experiment	12	17,58	224,00	71	0,162
Control	17	13,18	211,00		

Post-test findings

As a result of the Mann-Whitney U test, posttest scores show that there are significant differences between the groups in favor of the experimental group in the posttest total scores (U=45, p<0.05).

Table 5. Analytical Thinking Skill: Post-Test Analyze Results

Group	N	Rank Average	Sum of Rank	U	P
Experiment	12	19,71	236,50	45	0,012
Control	17	11,68	198,50		

Findings on the Relationship between Analytical Thinking Skills and Academic Success

A correlation analysis was performed to determine whether there is a relationship between analytical thinking and achievement test scores. The simple linear correlation procedure performed to reveal whether there is a relationship between students' academic achievement and analytical thinking skills shows that there is a positive and significant relationship between academic success and analytical thinking ($r=0.542$, $p<0.01$).

The variance explained by the variables in relation to each other is 30%. In other words, 30% of the change in academic achievement may be due to analytical thinking skills.

Table 6. Analytical Thinking Skill-Academic Achievement Relationship Analysis Results

		Analytical Thinking
Academic Achievement	Pearson r	,542**
	p	,002
	N	29

Qualitative Findings

Control group interview findings

Pre-interview findings

In the interviews with three randomly selected students from the control group, they stated that the students liked science subjects and experimentation, and they liked the science lesson because they learned through it.
The students defined the science lesson as a lesson environment in which the content is transferred and the question solution is made. They stated that while the teacher is in the role of conveying the content, the student is also in the role of listening, studying, and being aware of their responsibilities. Interviewed students stated that they like group work, doing homework, and doing research. While using the internet as the main source of information, they also benefit from peers, family, the internet, and books when deciding on the accuracy of this information.
For students in the decision-making process, it was determined that the students did not consider the options, although they thought about the situations in an orderly and solution-oriented manner. In addition, it has been determined that the students are based on specifying the feature of the criterion and determining the person suitable for the criterion while thinking analytically.

If evaluated in general, the control group students love science because it enables them to experiment and learn; the content of the science lesson is transferred; the question solution is done; the teacher is in the role of conveying the content; the student is in the role of listening to the lesson; the student is in the role of studying group work, homework, and researching; it has a profile that uses the internet as a source and makes use of peer and authority when deciding on the accuracy of information. Looking at this profile, it can be said that the students have a profile based on the traditional approach. Students do not consider the options while making a decision; they only aim to reach a solution by listing the situations. In the analytical thinking process, they tried to specify the feature of the criterion and determine the person suitable for the criterion.

Post-interview findings

When the data obtained from the post-interview interviews with three randomly selected students was analyzed, the students stated that the science lesson was structured so that the questions were written and the questions were solved. They stated that the teacher solves questions, makes explanations, and experiments during the lesson, and the student is in the position of writing and studying. In short, the reflections of the traditional approach are seen in the last interviews with the control group students, as well as in the preliminary interviews. For the decision-making process, reviewing and criticizing options has been effective. When the answers given for the analytical thinking skill were analyzed, it was determined that only one student was based on the features of evaluating the options and making validation. Contrary to the pre-interview, principles such as determining the feature of the criterion and evaluating compliance with the criterion were not encountered in the post-interview interviews. Analytical thinking themes and codes for the control group are given in Table 7 below.

Table 7. The analytical thinking theme and codes of the control group

Theme	Code
Analytical thinking	Criticizing the options
	Justifying or strengthening the claim
	Provability
	Verifiability
	Decision-making

The control group students made statements about the decision-making process in the interviews. Then comes the code of criticizing the options, strengthening or justifying the claim, and proving its provability and verifiability. One student could not answer the question for discussion. The students in the control group did not mention the arguments that make the discussion strong, and they did not fully understand and express the elements that make up the discussion and the ideology of the discussion. An example dialogue reflecting this situation is shared below:

Researcher *: When arguing with your friend on any subject, how do you determine who is right and who is wrong, or who is more correct?*

S_{C1} *: I first find out who is right and who is doing what. Ask each other what happened. By understanding their purpose. By understanding why they are fighting. If it was a lesson-related thing, I would look at the book and ask you. I'll see your ideas. I see who is right and who is wrong. I decide based on what I learn.*

Moreover, in addition to the fact that students do not understand the discussion process, it is seen that the reliability of the information is not based on scientific foundations and that there are associations with the sense of mutual trust mentioned in human relations, and this situation causes them to move away from the discussion process in their evaluations. An example of a dialogue reflecting this situation is given below. It has been determined that the students think authority-based in the decision-making process and that they cannot reach their decisions on their own. For example, a student made the following statement reflecting this situation: "*I will research it first. If I haven't come across it after searching, I'll ask my teacher."*

Researcher : When arguing with your friend on any subject, how do you determine who is right and who is wrong, or who is more correct?

S_{C2} : I trust whoever is more reliable. There is another thing. But he can use my trust.

Research : How do they ensure this reliability?

S_{C2} : They are telling me the truth. They're being honest.

Findings of the Experimental Group

Pre-interview Findings

In the interviews, when the answers given by the students to the questions about determining their attitudes towards science were analyzed, three students stated that they liked the science lesson. Students stated that the reason for liking the science lesson is that it is fun and provides access to information.

In the interview, the students explained the structure of the science course. It has been determined that they consider it a lesson environment where content is transferred and question solutions are made. In addition, they expressed the role of the teacher in the science lesson as conveying the content, and the role of the student as listening to the lesson, not angering the teacher, and being aware of their responsibilities. In addition, all of the students stated that they like group work, doing homework, and doing research, and that they especially benefited from the internet and reading as sources of information in this process. It is seen that they state that they are sure of the accuracy of the information obtained by comparing it with the internet, reading, and any authority.

Regarding the decision-making process, in any situation, it is seen that the students list the situations in the decision-making process, follow a solution-oriented path, but cannot fully evaluate the options. As for the analytical thinking skill, it is seen that the students are based on determining the feature of the criterion to be selected and the suitability of the person to the criterion, and they make justifications in this process.

In general, the experimental group students love the science lesson as it provides fun and access to information before the application, interprets the science lesson as a lesson environment where the content is transferred and

question solutions are made, keeps the teacher in the position of giving the lesson and the student listening to the lesson, loves doing group work, homework, and research, has a profile that uses the internet as a source of information, reads heavily from these sources, and is sure of the accuracy of the information from these sources. This profile represents the student profile in classes based on the traditional approach. Students try to choose the person who is suitable for the criteria, who can list the situations but cannot evaluate the options while making a decision, and who determines the characteristics of the criteria in the analytical thinking process by giving reasons.

Recent interview findings

When the data obtained from the interviews made with the experimental group students after the application were analyzed, they expressed the structure of the science course as a classroom environment in which writing and experiments were conducted. Regarding the difference between the lessons taught for the ABI process and the lessons before the application, they stated that this process provides learning, understanding, and explanation, facilitates learning, and is different from other lessons in terms of group work and discussion. While two students stated that they had difficulty adapting to the ABI process, they added that they adapted to this process over time. In addition, the students positioned the teacher in a position that asked questions and made the students think about the ABI process. In their statements, they emphasized that the student is in a position to write a report, share information, and interpret or discuss this process.

In general, when the pre- and post-interviews are evaluated together, they state that the experimental group students moved away from the traditional approach in the pre-test; they used statements about the research-inquiry approach that was dominant in the ABI process; they took the accuracy of the information and its support with justifications as criteria in the process, especially when making claims; they could not always reach a common decision in small group discussions, but they could not always reach a common decision in the continuation of the process with discussions or questions. It is seen that they express that they have reached a common decision by developing a strategy. It was determined that, especially during the large group discussions, the students questioned the ideas of other groups, asked for justification when they were confronted with a group with a different claim in these inquiries, and emphasized that this process provided peer teaching. Moreover, with these applications, the students understood the concepts more easily, learning took place, and they developed a positive attitude towards science.

Regarding the decision-making process, it is seen that at the end of the process, the students criticize the options and take their demonstrability as a basis. For analytical thinking skills, they specified criteria such as criticizing options, seeking provability, and justifying the claim. This situation can be evaluated as a reflection of inquiry on students' analytical thinking skills. The analytical thinking themes and codes of the experimental group are given below.

Table 8. The analytical thinking theme and codes of the experiment group

Theme	Code
Analytical thinking	Evaluating evidence
	Criticizing the options
	Justifying or strengthening the claim
	Provability
	Verifiability
	Decision-making

At the end of the interviews with the experimental group, the students emphasized processes such as evaluating the evidence, justifying or reinforcing the claim, provability, and verifiability, as well as using expressions for criticizing the options and making decisions. In addition, students were asked to evaluate the elements that make a discussion powerful. This is SE2's statement, *"The opinion is true; anyone can prove it,"* and SE3's, *"We have to present a claim first. Then we need to have reasons to make this claim. For example, if I have presented a claim to you, I need to strengthen it with my justifications.*" In addition, the experimental group students especially expressed the importance of presenting evidence in any discussion and emphasized the importance of this evidence in the process of persuading the other party. Below is a sample dialogue that reflects this situation:

Researcher : *When arguing with your friend on any subject, how do you determine who is right and who is wrong, or who is more correct?*

S_{E2} : *I'll prove it. I'll say it's wrong. If he is like Samet. When Samet was offended by us, he did not agree with our opinion. We tried to persuade Samet first.*

Add results and findings here. Add results and findings here. Add results and findings here. Add results and findings here. Add results and findings here. Add results and findings here. Add results and findings here. Add results and findings here. Add results and findings here. Add results and findings here.

Discussion and Conclusion

The main purpose of this study is to examine whether the application of the ABI approach has an effect on the academic success and analytical thinking skills of 7th grade students. As a result of the study carried out for this purpose, it was determined that the 7th grade students to whom the ABI approach was applied differed significantly from the traditional method with the unit-based academic achievement test, analytical thinking test, and semi-structured interviews. It can be said that the ABI application is effective for the academic success of the students. Many studies in the literature in which ABI was applied have created significant differences in post-test scores (Akkuş et al., 2007; Hand & Keys, 1999; Hıhenshell & Hand, 2006; Kabataş et al., 2008; Kabataş Memiş et al., 2009). The results of these studies and the results obtained in the present study show parallelism with each other.

During the ABI approach, students become more involved in the learning process cognitively and metacognitively. With the ABI process, students stated that they were willing to complete the activities, which are cognitive activities, but also realized that they needed to make connections between various elements (Hand et al., 2004). When the findings obtained from the scenarios measuring analytical thinking skills were examined, it was found that there was no significant difference between the application and control groups in the pre-test of analytical thinking skills. In this respect, it can be said that the analytical thinking skills of the experimental and control group students were similar at the beginning of the study.

When the findings of the analytical thinking post-test applied at the end of the study were examined, it was determined that there was a significant difference between the groups in terms of the analytical thinking skills of the students, and it was in favor of the application group. The use of the ABI approach in science lessons improved students' analytical thinking skills. 30% of academic heads explain analytical thinking skills.

When we look at the literature, there are results showing that the application of ABI positively affects many skills, such as critical thinking and problem solving skills (Çakan Akkaş & Kabataş Memiş, 2021; Öz, 2020). Individuals who have gained research-inquiry skills effectively use some high-level skills such as analysis, synthesis, and evaluation in the process (Ocak & Akkaş Baysal, 2021). It can be said that during the application process, students' ability to determine the relationship between claims and justifications, evaluate the justifications, and analyze by presenting evidence during the actions of thinking, creating reasons, and collecting evidence for these reasons improves their analytical thinking skills. The data obtained from the interviews with the students also points out the effect of the ABI application on the analytical thinking process. The difference between the answers to the analytical thinking questions before and after the ABI application supports this.

While the students in the experimental group emphasized factors such as basing a claim on evidence, justifying the argument, and being proven or verified, the control group students expressed that they were not familiar with the discussion process, that they had to get support from a certain authority in the decision-making process, and that they could not make adequate assessments about the discussion. summarizes. There is a high level of positive correlation between analytical thinking and other high-level skills and students' communication and cooperation skills (Tsai et al., 2012).

Recommendations

This study was carried out with 7th grade students in the "Force and Energy" and "Force and Motion" units. A similar study can be applied to different grade levels, different units, and larger samples. In addition, a similar study can be conducted in regions with different socioeconomic and sociocultural characteristics.

Other studies to develop analytical thinking skills by using the ABI approach can be researched at the primary, secondary, and higher education levels. Training can be given in order to enable teachers to practice ABI. Thanks to the training provided, teachers will be able to apply the ABI approach correctly and effectively. Then, the effectiveness of these trainings can be evaluated.

Author (s) Contribution Rate

The contribution rate of the authors in this study is half.

Ethical Approval (only for necessary papers)

Ethical permission (07.12.2021-UADAUC3) was obtained from Kastamonu University's Social and Human Sciences Research and Publication Ethics Committee institution for this research.

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Teaching or testing, which matters more? Transition among education levels in Turkey

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Teaching or testing, which matters more? The transition among education levels in Turkey

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Abstract

This study analyzes the alignment between the educational policy of Turkey and high-stakes tests administered for students transitioning from secondary to high school. Research questions focus on the opinions of secondary school teachers about the alignment between transit exam questions and curricula, course books and materials, and their views on high-stakes testing. The research used a survey study model utilizing the triangulation design. A total of 109 teachers from six different majors working in Ankara participated in the study. An online survey consisting of eight questions was used to get teachers' opinions. The research question was analyzed using quantitative (percentages) and qualitative (content analysis) methods. Results showed that education serves dominantly for tests emphasizing a testing-oriented education system in the current Turkish learning and teaching process, which contrasts with education policy documents targeting 2023.

Keywords: Educational policy, High-stakes tests, Transition among education levels, Alignment between educational policy and high stakes tests.

Introduction

Educators, principals, families, and state education departments have been familiar with the international PISA and TIMSS tests since they were first launched in 2000 and 1995, respectively. Each year, country reports for global test results are published, laying out the success levels of students in reading, mathematics, and the sciences. Thus, it is not surprising that countries with high scores in these tests have been thoroughly investigated while other countries that fall below the OECD rankings have searched for ways to improve their scores for "accountability."

In a competitive world where international multiple-choice tests compare the success levels of students, it is not surprising to observe educational systems driven by this high-stakes testing paradigm. As Wheatley (2015) suggests, academic terminology started to refer to students as customers and principles as CEOs in schools. According to Wheatley (2015), market economy influences on schools have been financially advantageous for corporations that have long considered schools a threat to corporate ideology. Accountability policies and high-stakes tests re-conceptualized education with a strong market orientation, which had an essential effect on the political agenda (Hacker & Pierson, 2010).

Test-Driven Education and the Problems of High-Stakes Testing

Test-driven education includes pedagogical practices and activities and after-school tutoring services aiming to prepare learners for standardized tests and high-stakes exams and, by extension, to cover all types of exams and tests (Bemmoussat & Bouyakoub, 2019). The need for test-driven education and high-stakes tests deserves significant attention and questioning. In countries with a social state, selection and/or elimination of excessive quotas are not required since no significant quality differences can be found among public schools. However, in countries with differences among public schools regarding quality, prestige, opportunities, and capacity, students are selected through exams (Atılgan, 2018). Emery and Ohanian (2004) comment that the corporate players have a significant role in the move toward accountability. Accountability based on tests has been profitable for corporations, as it limits curricula and assessments to corporate products. Standardized tests and test preparation materials have helped certain corporations earn lots of money (Wheatley, 2015).

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In certain countries, such as Korea, where academic achievement in high-stakes tests determines the future lives of their students, academic achievement is salient not only for kids but also for their families (So & Kang, 2014). As a result, teaching to the test or for the test dominates the learning-teaching process, limiting student learning solely to test items (Sung & Kang 2012). A similar case is observed in China, where the National College Entrance Exam (NCEE) has ruled China's educational system and shifted the purpose of education to test preparation, where the system overshadows every household (Wang, 2020). A similar exam process can be found in Vietnam, where the education process is based on a test-driven paradigm (Pham, 2021).

The literature illustrates the drawbacks of high-stakes testing in education. One drawback is termed score inflation. According to Hamilton (2011), teachers tend to shift their teaching methods to aim to cover the test items; thus, students succeed in these tests in the short run. Thus, parents push their children to compete with tested content even in kindergarten. As higher scores mean better colleges, students, parents, and principals become obsessed with test preparation, which has created a growing private tutoring industry (Xue & Ding, 2009). Wang (2020) states that the Chinese Ministry of Education has forbidden teachers in public schools to offer these services, but it has allowed institutions outside of the school system to provide them. A very striking and extreme case from Vietnam reports that some students committed suicide because they failed the university entrance tests (Pham, 2021).

The overemphasis on testing and assessment has thus turned teachers into test specialists, devoting their classroom time to test preparation. Under these circumstances, teachers might ignore extracurricular activities, alternative assessments such as portfolios, and activities to foster reasoning and critical thinking skills core to real learning (Bemmoussat & Bouyakoub, 2019). In addition, Musoba (2011) states that high-stakes testing negatively affects student and teacher morale and increases their stress levels.

Turkey is no exception. Turkey has been reforming the education system, including curriculum changes in primary, secondary, and tertiary education, changes in the transition of education levels, and the national tests administered in secondary and high schools (OECD, 2020). The reform movements on education and assessment policies can be found in the 11th Turkish Development Plan and 2023 Education Vision documents.

11th Turkish Development Plan and 2023 Vision for Education Document

The Eleventh Development Plan (2019-2023, which will be referred to as DP) was approved in the 105th plenary session of the Grand National Assembly of Turkey on July 18, 2019, by the provision of Law No. 3067, dated October 30, 1999. Designed as the first five-year part of a fifteen-year perspective, the Development Plan envisages an overall change and breakthrough in all fields and a resolute and uninterrupted implementation in the long-term perspective (DP, 2019). One of the pillars of the DP focused on quality education and set forth the expectations for education in the next five years. The main objective of education was stated (DP, 2019, p. 138):

> The primary objective is to raise happy and productive individuals who have advanced thinking, perception, and problem-solving skills, self-confidence, a sense of responsibility, entrepreneurial and innovative peculiarities, internalized democratic values and national culture, are open to sharing and communication, have a strong sense of arts and aesthetics, and are skilled at using technology by enabling access to comprehensive and qualified education and lifelong learning opportunities for all individuals.

To achieve this objective, specific policies and measures were called for. The ones concerning the relationship between education and assessment are notable. First, the document states that the disparities in success among schools will be reduced by increasing the quality and facilities of schools at all levels of education (p. 140). This is a challenging target, considering this disparity has evolved over many decades. Next, it states that an efficient measurement, monitoring, and evaluation system will be established to diversify and increase the students' educational attainments and form teaching programs as a flexible, modular, and applied structure. The assessment and evaluation system will be strengthened based on competence. (p.141) More importantly, the document cites that to reduce the pressure created by the education system on the students, arrangements will be made for the exams held for the transition between educational levels.

The 2023 Vision for Education Document (VFO), prepared in the frame of the 11th Development Plan, is another salient document showing the relationship between education and assessment policy. The basic policy of the VFO (2021) document revolves around an individual's progress toward self-knowledge, which implies

that he or she has created a customized roadmap for his or her educational journey (p. 21). The document blames packaged curricula for being compulsorily uploaded into children's minds like boxes to be filled. Teachers are responsible for monitoring and evaluating learning without causing any fear or pressure, treating evaluations as instruments to improve the learning process. In all evaluation processes, teachers are on the side of the students, not against them (p. 22). The document further envisions that the models will also offer customized experiences for each student and help students control their learning processes, assuming responsibility for their own learning (p. 33). Thus, based on the DP, VFO aims to establish a measurement system where each student will be evaluated based on personal development rather than comparing him or her, as in national high-stakes tests. Regarding level transitions among education levels, the VFO states that the ministry's medium-term goal for transition to secondary education and higher education is to reduce the need for competition and elimination-oriented exams. Two pillars were framed for this purpose (p. 33–34). The first pillar includes reducing the disparities between schools and regions. In addition, the second pillar consists of developing flexible models for exam-free placement and using central exams only for specific purposes. Thus, on the one hand, the Ministry of Education (MoNE) declared to reduce the success differences within and among schools. On the other hand, it aims to use alternative assessment methods more than centralized, high-stakes tests. The VFO document also targets reducing the need for private tutoring institutions, which have been shut down, and private course centers, which are still in operation, originating from the existence of a multiple-choice exam system that is predominantly competition- and elimination-oriented (p. 34).

Secondary School High Stakes Testing System in Turkey

In Turkey, the education system is highly examination-oriented. Therefore, the performance of the students, teachers, and even schools at each ring of the system is evaluated by student performance on various exams. (Hatipoğlu, 2016).

In recent years, the transition system to high school from secondary school has changed many times. Secondary school curricula changed in 2005, 2012, and 2017 based on constructivist and active learning theories (MoNE, 2017; TTKB, 2017). The transition to certain prestigious high schools, namely science, social, Anatolian, Anatolian teacher training, and Anatolian imam preacher, was based on student scores at high school entrance exams. In 2005, this exam was named OKS (exam for transfer to high school). In 2008, it was renamed SBS (exam for placement). In these high-stakes tests, students got tests at the end of 6-7-8th grades, comprising 70% of their final grades. The other 30% belonged to overall school success grades. In 2013, the exam was renamed TEOG (transition exam from fundamental to secondary education). In 2018, the exam was renamed LGS (transit to high school exam). The latest LGS exam measured reasoning ability and logic within the framework of the PISA and TIMSS exams. While successful students can enroll in prestigious high schools, unsuccessful students may enroll in address-based local schools. The exam comprises six lessons and is conducted in two sessions at the end of 8th grade (Çelik, 2015).

The central government closed the long-prevailing private courses that prepare students for the tests in 2014, stating that these private courses violate educational equality, especially for poor children. Then, in 2015, public schools offered free courses to better prepare students for high-stakes tests. In addition, students willing to take these courses could study at the weekends in their schools with their teachers.

Meanwhile, although these courses have been offered free at public schools since 2015, private educational institutions for test preparation purposes were not closed down; only their names were changed to study centers. As a result, there are currently 2538 private study centers under various names. These centers officially serve one course; however, it is well known that they serve as test preparation centers for all courses (Aydın, 2021). Thus, private courses are still dominating the market, floating educational inequality.

Despite all these private courses and the money families spend on national high-stakes tests, students have been unsuccessful in these tests. Table 1 shows the student success levels in the LGS exam for the last three years.

Table 1. 2019-2021 student success at LGS exams (SETA, 2021)

Test	Number of questions	2019 mean score	2020 mean score	2021 mean score	Change in mean scores
Turkish	20	11,75	10	9,41	⇓
History	10	6,88	5,05	5,23	⇔
Religion	10	6,83	6,39	6,35	⇓
Foreign language	10	4,65	3,53	4,93	⇔
Mathematics	20	5,09	4,89	4,20	⇓
Sciences	20	9,97	10,21	8,04	⇓

As seen in Table 1, student scores consistently decreased in Turkish, religion, and mathematics courses, and this decrease in student scores is noteworthy. On the other hand, they almost stayed the same in science, history, and foreign languages.

Literature Review

There are some studies in Turkey regarding the problems of educational policies. For example, Gedikoğlu (2005) stated that the most critical problem in the education system is the lack of sustainability in educational policies. Large-scale, high-stakes tests were stated as the prime reason for this lack. Kartal (2013) similarly offered that centralized, high-stakes tests had to be abandoned to improve Turkey's measurement and evaluation system. In another salient study, Neyişci et al. (2020) found that the second most crucial problem for teacher candidates, according to media news, was about educational policies, and they offered to improve the current educational policies. Finally, in an international study, Jackson (2020) examined socioeconomic inequalities at the critical transition points in the Russian system, asked whether there is evidence that high-stakes tests play a unique role in producing inequalities in transition taking, and found out that high-stakes standard tests have close relations with socioeconomic inequalities.

Some salient Turkish studies are being conducted in the Turkish context on high-stakes transition tests from secondary to high schools until 2021. Atılgan (2018) states that in Turkey's experience in transition among levels for more than half a century, rapidly changing systems have resulted in some harmful outcomes, which can be listed as nonfunctioning schools and the curriculum, excessive utilization of exam preparation resources outside the school, increased gaps in the quality differences among high schools, constant exam stress and pressure, and selection of schools, majors based solely on the exam score. Aslan (2017) concludes that the education level of families and their yearly expenditures on education are important factors. This research shows that student success increases when family education and yearly expenditures increase. Şad and Şahiner (2016) investigated the views of students, teachers, and parents about the high-stakes testing system called TEOG, launched in the 2013-2014 school year. They found that the need for private courses and tutoring remained a significant drawback. Although the literature is rich in showing teachers' points of view on high-stakes tests in Turkey, there is a significant gap in showing the alignment between educational policy and accurate assessment implementations in the context of high-stakes tests. Another salient study by Kumandaş and Kutlu (2010) showed that the transition exams test-takers get to enroll in prestigious high schools fall short of reflecting the students' achievement in real-life situations. In addition, writers warned that the test creates adverse effects on students, such as fear of being unachievable, test anxiety, and some health problems.

Problem

In the 11th Turkish Development Plan and 2023 Vision for Education Document, both salient policy-making documents for the following educational initiatives to be followed by the MoNE schools, skills such as advanced thinking, perception, and problem-solving, as well as self-confidence, a sense of responsibility, internalized democratic values, and national culture, are emphasized. In addition, both documents emphasize forming teaching programs as a flexible, modular, and applied structure and strengthening the assessment and evaluation system based on competence. To reduce the pressure created by the education system on the students, specific arrangements were promised to be made for the exams held for the transition between educational levels. The medium-term goal for the transition to secondary and higher education was to reduce the need for competition and elimination-oriented exams (DP, 2019; VFO, 2021).

On the other hand, exam-driven, high-stakes tests are gaining more importance, especially among level transitions from secondary to high school and from high school to university. In Turkey, students' success in high-stakes tests is publicly advertised nationwide. Thus, an important question needs to be answered based on research: "Could the expectations on assessment stated in education policy documents be actualized in reality?" For quite a long time in Turkey, national transit tests from secondary to high schools were criticized, stating that the questions in the exams were not aligned with the curriculum changes of 2012 and 2018 and that they mostly asked for lower levels of rote learning. With the latest exam type change in 2018, questions were criticized for asking students to think more analytically based on reading comprehension and requiring more time to answer the questions successfully. In addition, many teachers complained that students were not ready for such a radical change in the exam type. Thus, this study will fill an essential gap in the literature by analyzing teachers' opinions from various domains on the latest secondary school exam type (LGS) change since 2018. In addition, the alignment between educational policy documents and high-stakes tests will be explored.

Aim

This study aims to analyze the alignment between the expectations on assessment stated in educational policy documents and LGS high-stakes tests for transitioning from secondary to high school based on secondary school teachers' opinions. Through an online questionnaire consisting of eight open-ended questions, such variables as components of the educational processes, reasons for the success or failure of students in such tests, and the actualization of policy expectations were analyzed. This study, then, aims to reveal whether high-stakes tests (LGS) are a means or an end in themselves. In addition, teachers' opinions toward a better alternative for high-stakes tests were explored.

The research question in the study is:
1. What are the opinions of secondary school teachers about the
a. alignment between the questions asked in the LGS exam and the knowledge and skills presented in the curriculum,
b. alignment between questions asked in the LGS exam and the compulsory course books and materials,
c. usefulness of sample LGS exam questions,
d. importance of curriculum components,
e., emphasis on teaching or testing,
f. reasons for success or failure of students in the high school entrance exam in the last three years,
g. alternative criteria for the transition to high schools,
h. impact of managers and families on the success/failure of students on the LGS exam?

Method

This research was conducted based on a survey study model to reveal the opinions of secondary school teachers about the stakes tests. Triangulation was adopted in this study, in which the researcher used quantitative and qualitative data to study the same phenomenon to determine if the two converged upon a single understanding of the research problem. In this research, quantitative and qualitative data are given equal priority. When data are collected concurrently, quantitative and qualitative data are gathered simultaneously, and the implementation is simultaneous. Therefore, quantitative and qualitative data had equal priority in combining and interpreting results. An integrating strategy was utilized for mixing the data, integrating the two databases by merging the quantitative data with the qualitative data (Creswell, 2009).

Population and Sample

The study population comprises 109 secondary school teachers working in 92 state and 17 private schools in Turkey-Ankara. The snowball sampling method was used with 109 teachers who voluntarily participated in the study. The demographics of the participating teachers are displayed in Table 2. Most are female (76%) and public school teachers (84%).

Table 2. Demographics of participating teachers

Gender	f	%
male	26	24
female	83	76
Type of school	f	%
state	92	84

private	17	16
Teachers' major	f	%
Turkish	16	15
History of the Turkish Revolution	17	16
Religion and ethics	7	6
Foreign language	24	22
Mathematics	21	19
Science	24	22
Total	109	100

Data Collection and Analysis

Data were collected through an online survey, which included eight open-ended questions. The first four questions collected quantitative data and were analyzed by quantitative statistics. Answers to the first three questions were analyzed by percentages, whereas answers to the fourth question were analyzed by getting the arithmetic mean of the answers given. For this question, the most critical component was scored as 4 points, the second most crucial component got 3 points, the third most important component was granted 2 points, and the least essential component was scored as 1 point. Then, all scores were calculated (added up), and components were ranked according to their total scores. Questions 5 to 8 were analyzed by the content analysis method. To check the effectiveness of open-ended questions in revealing the teachers' opinions, experts (faculty members) in curriculum and instruction, measurement, and evaluation were consulted. The questionnaire was piloted with five secondary school teachers to determine the suitability and comprehensiveness of the questions before its comprehensive implementation. It was finalized considering the responses received from these teachers.

Permissions for conducting research were granted from the Ankara Provincial Directorate of National Education and the TED University Ethics Committee (no. E-27535802-100-13170). Before the implementation, secondary school teachers working at different secondary schools in Ankara (150 graduates) were e-mailed about the purpose and content of the study, along with the online survey link and the online consent form. Then, they were asked to send the research information, consent forms, and survey link to their colleagues. Then, a total of 109 secondary school teachers willingly filled out the online survey. A pattern-coding method was used where the researcher first determined the themes and appropriate codes were placed into them (Miles & Huberman, 1994).

Results

For the survey, teachers' opinions were analyzed to present the findings. In the following sections, the findings of each survey question are presented separately.

Alignment between the Questions Asked in the LGS Exam and the Knowledge and Skills Presented in the Curriculum

Table 3 shows the teachers' opinions regarding the alignment between exam questions and the curriculum. According to the results, 59% of history, 86% of religion, 88% of foreign languages, and 96% of sciences course teachers believe there is alignment between the questions asked in the LGS exam and the knowledge and skills presented in the curriculum. However, teachers believe the opposite for two courses: Turkish (38%), and mathematics (38%).

Table 3. Opinions of the teachers regarding the alignment between exam questions and the curriculum

	Aligned	Partially Aligned	Not aligned
Turkish	6	1	9
History of the Turkish Revolution	10	3	4
Religion and ethics	6	-	1
Foreign language	21	2	1
Mathematics	8	1	12
Science	23	-	1

Alignment between Questions Asked in the LGS Exam and the Compulsory Course Books and Materials

Table 4 shows the teachers' opinions regarding the alignment between exam questions and the course books and materials used.

Table 4. Opinions of the teachers regarding the alignment between exam questions and the course books and materials used

	Aligned	Partially Aligned	Not aligned
Turkish	2	3	11
History of the Turkish Revolution	11	4	2
Religion and ethics	4	1	2
Foreign language	14	4	6
Mathematics	2	2	17
Science	5	4	15

The findings show that 65% of history, 57% of religion, and 58% of foreign language course teachers see a strong alignment between the questions asked in the LGS exam and the compulsory course books and materials used. However, for three courses—Turkish (13%), mathematics (10%), and sciences (21%), teachers believe the opposite, and they find the course books and materials ineffective.

Perceived Usefulness of Sample Exam LGS Questions

Table 5 shows the teachers' opinions regarding the usefulness of sample exam questions released by MoNE.

Table 5. Opinions of the teachers regarding the usefulness of sample exam questions released by MoNE

	Useful	Partially Useful	Not useful
Turkish	14	1	1
History of the Turkish Revolution	14	2	1
Religion and ethics	6	-	1
Foreign language	17	6	1
Mathematics	19	2	-
Science	23	-	1

The findings illustrate that for all majors, 88% of Turkish, 82% of history, 86% of religion, 71% of foreign languages, 90% of mathematics, and 96% of science teachers found the sample exam questions released by MoNE each month useful for the students.

Importance of Curriculum Components

Table 6 summarizes the importance attached to curriculum components by major.

Table 6. The emphasis given to curriculum components by major

	The most critical (highest emphasis)	The second most important (second highest emphasis)	The third most important (third highest emphasis)	The least important (least high emphasis)
Turkish	objectives	content	learning-teaching process	evaluation
History of the Turkish Revolution	objectives	content	evaluation	learning-teaching process
Religion and ethics	objectives	evaluation	content	learning-teaching process
Foreign language	objectives	learning-teaching process	content	evaluation
Mathematics	objectives	evaluation	content	learning-teaching process
Science	objectives	content	evaluation	learning-teaching process

According to teacher responses, objectives were regarded as the most critical component of all curricula in all majors. However, while Turkish and foreign language teachers emphasized evaluation as the least essential

component of their courses, for history, religion, mathematics, and science courses, teachers emphasized the learning-teaching process as the least essential component of their courses. It is also important to note that teachers highlighted evaluation as the second-most crucial component they focused on for religion and mathematics courses. In contrast, it was considered the third most important in history and science courses. Further, the learning-teaching process was the second most important for foreign language teachers and the third most important for Turkish teachers.

Tests for Education or Education for Tests?

According to Figure 1, almost all the teachers in all majors (81 out of 94) expressed that education serves predominantly for tests. This is especially obvious for religion, science, Turkish, history, and mathematics majors. All the religion (n = 7) and science teachers (n = 22) believe education is for tests. One science teacher confessed, "All the education process is there to serve tests. Principles, families, and children focus on topics asked in the exams. The kinds of methods we are employing are not important. Students are unwilling to participate in projects, scientific activities, or field trips and do not even want to read books." Another science teacher warned that students are stressed because of high-stakes testing at schools, saying, "All this system is serving for tests. Individual differences between children are ignored. They are treated as if they all have the same skills and abilities. Families and school personnel are stressed, and children are more stressed." A Turkish teacher finally warned policymakers, saying, "The priority of the Turkish secondary schools seems to be increasing the number of successful students in the LGS exam. We can see examples on certain schools' walls that advertise their successful students in the test. Thus, especially in the 8th grade, schools turn out to be more test-centric."

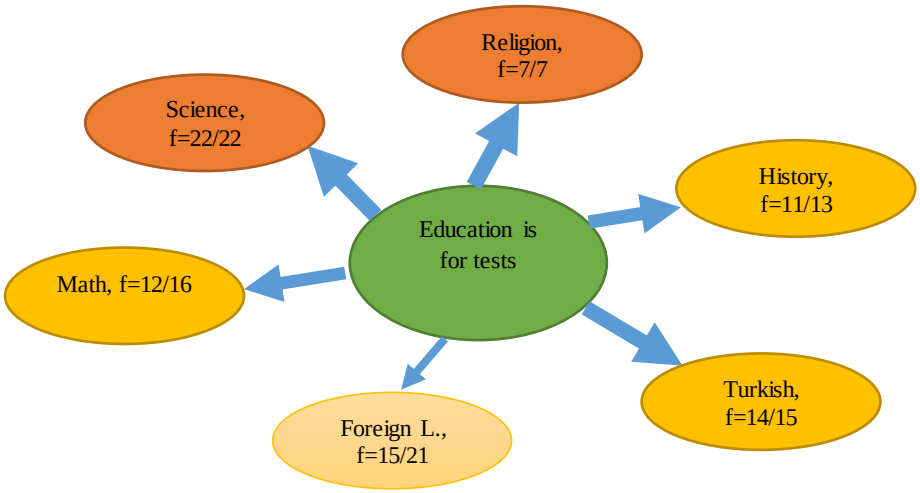

Figure 1. Teachers who believe that the education process is for tests.

Reasons for the Success or Failure of Students in a Course

The findings obtained for this theme are displayed in Figure 2. Many teachers (f = 29) in all majors expressed that the pandemic and distance education negatively affected students' LGS exam success, especially in 2020.

As one science teacher remarked, "The decrease in the success level of students in 2020 is related to distance education in the pandemic period. Attendance was unimportant, and students did not turn their cameras on during lessons. Thus, I believe that many students did not follow the courses. Greater flexibility brings failure." Many teachers (f = 26) from various majors stressed the lack of congruence between the activities and measurement in the curriculum and the question types asked in the latest LGS exams. This is especially apparent in mathematics and science courses. One science teacher noted, "Question types changed in the exam. There are no longer questions at the knowledge level, but they now require reasoning skills, so higher-order skills are emphasized. Questions are now based on real-life cases and experiments, but the curriculum content and course book activities are still based on knowledge transfer." Many teachers (f = 19) from different majors put students' lack of reading comprehension and reasoning skills as reasons for failure in LGS exams. This is quite apparent for Turkish teachers. As one Turkish teacher noted, "We, as a nation, do not like reading and researching, and we only do this to get a better job. When the aim is only to get a job, we come across a generation who cannot interpret what they have read." Other teachers (f = 10) stressed the inefficiency and ineffectiveness of their compulsory course books and materials used at schools. Teachers of history, foreign languages, and

mathematics stressed this heavily. A few teachers (f = 8) stated that questions' value (coefficiency) differs for different majors. Thus, students only prioritize the courses with the maximum value (coefficiency) in the LGS exam. Teachers of foreign languages, religion, and history fall into this category.

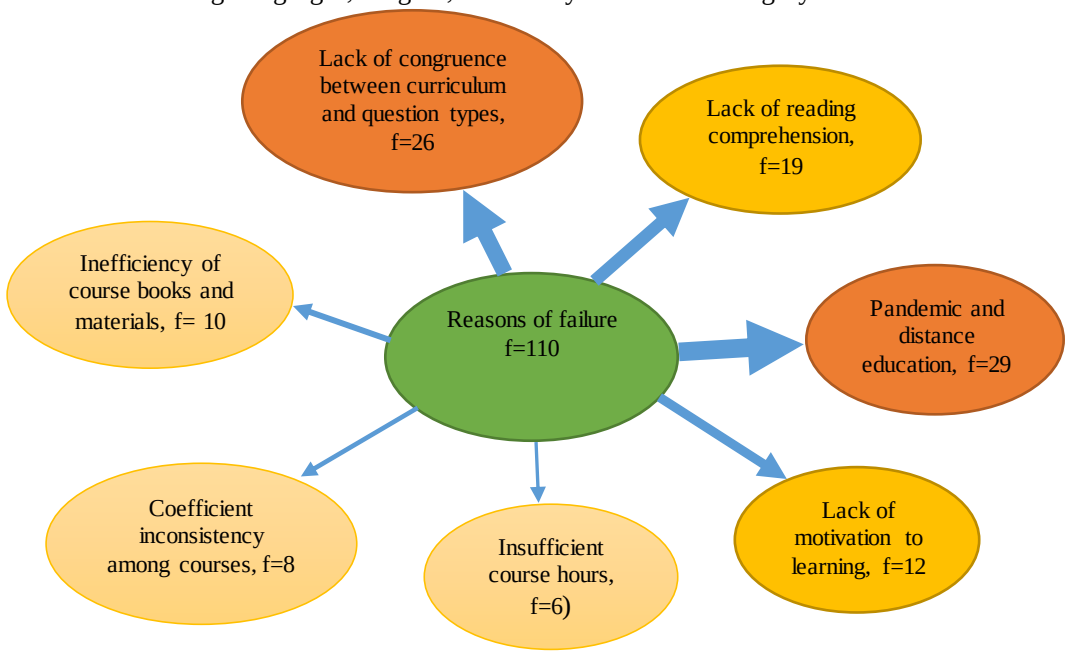

Figure 2. Reasons for failure of students in the last three LGS exams.

Alternative Criteria for the Transition to High Schools

The findings obtained for this theme are displayed in Figure 3.

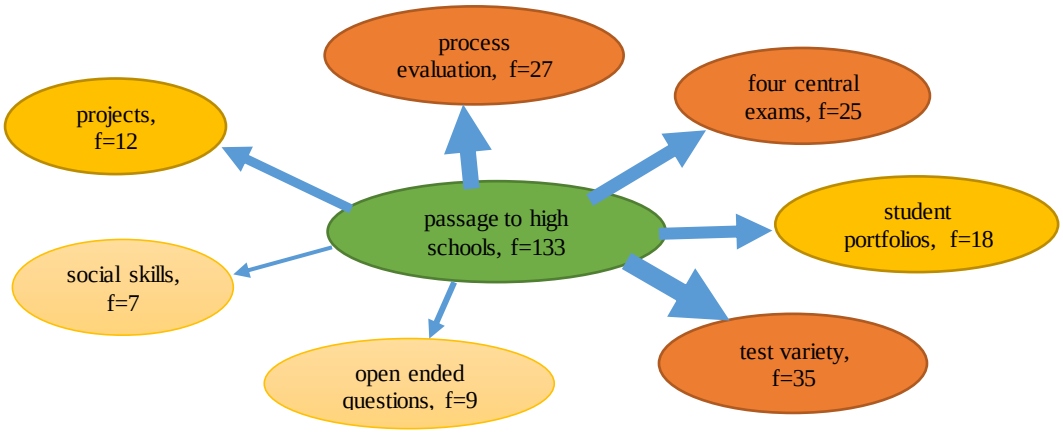

Figure 3. Alternatives to LGS for the transition to high schools.

Most teachers from various majors (f = 35) stressed the need for test variety as an alternative to the LGS exam for transitioning to high school. Teachers offered that students should be carefully observed and guided by their teachers from the beginning of secondary school and directed towards the correct type of high school they will best fit into. For this, teachers offered to administer different types of tests for different high schools. For example, one foreign language teacher offered, "The test for the science high schools and the Anatolian high schools should be different. Likewise, there should be skills and aptitude tests for students enrolling in technical high schools." Many teachers (f = 27) commented that process evaluation should be more valuable and worthwhile. They offered that student achievement scores from their schools at the end of four years should have a heavier weight on the overall evaluation score. Thus, teachers could be more significant in deciding the performance of their students. As one Turkish teacher offered, "This could be as simple as adding 60% of LGS scores and 40% of accumulated achievement scores that students get within four years in their courses." Some teachers (f = 18) offered that students should have portfolios as an alternative or an additional assessment method for transitioning to high school. Other teachers (f = 12) offered that students should participate in

projects, which could be used as an alternative or an additional assessment method for the transition to high school.

Impact of Managers and Families on the Success/failure of Students on the LGS Exam

The findings in Figure 4 show that most teachers (f = 31) stressed more negative impacts than positives on the effects of families and managers. Regarding negatives, teachers (f = 21) put forward the pressure families put on children. One science teacher said, "Because of the country's economic conditions, young people and families are anxious, and the only way to get rid of that is to succeed in high-stakes tests. Families, thus, put pressure on kids, and we do too." A mathematics teacher stressed, "Although a child is interested in other fields such as music or the arts, the family pushes the kid to become a medical doctor or an engineer, which creates pressure on the child to become more successful in LGS. Then, that kid unwillingly starts studying math and science." Another negative impact from families and managers is the pressure put on teachers. Teachers (f = 10) complained that they feel pressure, especially from families, to make their kids more successful in the LGS exam. One science teacher commented, "The most important thing is to make students more successful in tests. What matters is the number of our students enrolling in science high schools. The higher our grade point average in the exam, the more successful we are considered."

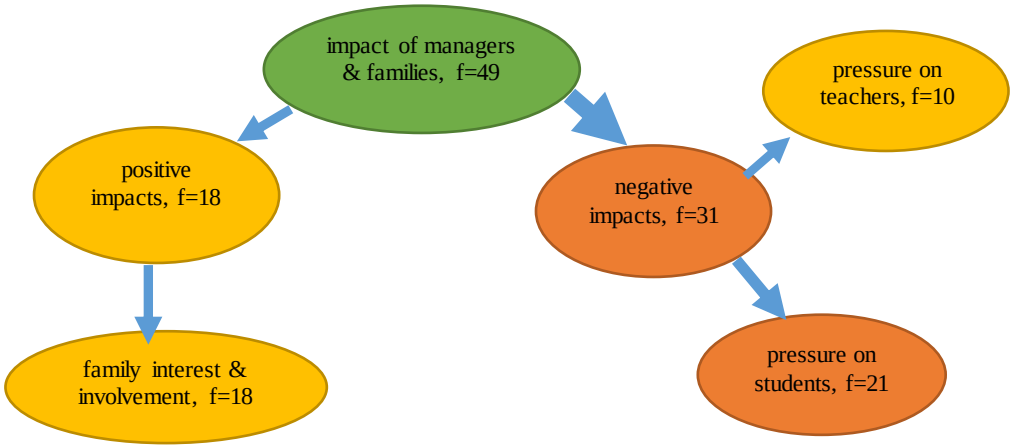

Figure 4. Impact of managers & families on student success

Discussion and Suggestions

A noticeable finding in the study was that almost all the teachers in all majors expressed that education serves primarily for tests. This is especially obvious for religion, science, Turkish, history, and mathematics majors. Caner and Bayhan (2020) criticize high-stakes examination policy change and school conversions in Turkey, stating that the two worked in a mutually reinforcing manner and fed into the neo-liberalization of the education system. This contrasts with Turkey's educational policy documents, which emphasize individual differences, learning styles, and students' multiple intelligences as active rather than passive learners.
This result also supports the findings of So and Kang (2014), whose study in Korea found that students, parents, and high schools become obsessed with test preparation, and this has created a growing private tutoring industry and allowed institutions outside of the school system to provide them, enlarging the education inequality between urban and rural areas. Thus, as the studies above indicate, Turkey should avoid this test-driven paradigm, considering the evidence that the USA's test-driven education system experienced negative consequences on multiple grounds (Wheatley, 2015). However, it is not an easy task to transform the "teach to the test to test what you teach" paradigm quickly, just as Sirotnik (2004) stated that meaningful and long-lasting change only occurs when all the participants in education (social, political, and economic) are committed to and support change. Moreover, keeping up with the agenda stated in educational policy documents for assessment practices is imperative. This is crucial for the sustainability of educational policy implementation. However, the results of this research show that, in contrast to the expectations from the assessments in policy documents, implementations heavily emphasize high-stakes tests.

Teachers in this study believe that the questions asked in the LGS exam and the knowledge and skills presented in the curriculum of their courses are aligned. However, they believe the opposite for two courses: Turkish and mathematics. In addition, while history, religion, and foreign language teachers see an alignment between the

questions asked in the LGS exam and the compulsory course books and materials used, Turkish, mathematics, and science teachers believe the opposite. It is salient that tests should follow and be aligned with what is taught in the curriculum, as curriculum documents reflect the expectations stated in the policy documents. Considering that Turkish and mathematics are the two most essential courses with the highest score value in the LGS exam, it is apparent that the alignment among questions and knowledge or skills presented in their curricula should be analyzed in further studies. As Hamilton (2011) argues, when standards and high-stakes tests are not fully aligned, educators tend to rely more on the tests than on the standards for instructional guidance. Therefore, curricula should be revised for their alignment among the four curriculum dimensions and especially in terms of the philosophy that they adopt. Coşkun (2017), for instance, criticizes the curricula, stating that the number of objectives that go beyond the knowledge level is minimal and that there is not enough explanation about how the objectives will be measured. On the other hand, teachers' responses reveal a call to prepare course books and extra materials, which will suffice for the types of questions and skills asked in the LGS exam. This is apparent in Turkish, mathematics, and science courses.

Almost all the teachers in the study stressed that they found the sample online exam questions released by the MoNE each month beneficial for the students. Thus, releasing these sample questions in the future needs to be expanded by increasing their numbers and qualities.

Regarding the importance of curriculum components, objectives and evaluation were regarded as the most critical components of all curricula. Considering that almost all teachers highlighted objectives and evaluation as the leading components of curricula, it may be said that teachers are objective and evaluation-oriented, which the MoNE centrally determined. More striking is that while Turkish and foreign language teachers emphasized evaluation as the least essential component for history, religion, mathematics, and science courses, teachers emphasized the learning-teaching process as the least important component. This finding is crucial to showing the relationship between the philosophy adopted in educational policy documents and teachers' beliefs in implementing them. As educational policy documents reflect individualized, not one-size-fits-all, learning and as the ultimate goal is to provide a learning environment where students actively participate in the learning process by acquiring capabilities such as independent learning and self-evaluation, teachers are expected to stress the learning-teaching process more than the evaluation component of the curricula. Like educational policy document expectations, the new LGS exam requires students to think critically and analytically while emphasizing reading comprehension and reasoning skills. In contrast, teachers of history, religion, mathematics, and the sciences surprisingly prioritize evaluation and trivialize the learning-teaching process. For this, secondary school teachers of history, religion, mathematics, and the sciences should be offered in-service training focusing on the philosophy and actualizing expectations stated in the education policy documents.

For the reasons for the failure of students over the last three years in the LGS exam, teachers mostly blamed the pandemic and distance education, the lack of congruence between the activities and measurement in the curriculum, the question types asked in the latest LGS exam, as well as the lack of reading comprehension and reasoning skills of students. The sudden distance education process associated with the pandemic may have negatively affected students. Further studies may reveal the learning losses of students during these two years. Echoing Au (2017), who stressed that high-stakes testing in the USA hit lower-income kids more than others, decreasing the opportunity for equality, pandemic, and distance education during this crisis time may also have increased this inequality among poor and wealthy students because of their success at high-stakes tests. The case is similar in Turkey, with diverse student populations in various districts. Thus, as Shohamy (2001) stressed, a new testing system (the new LGS implementations in the Turkish context) should occur only if it positively changes the educational system.

Regarding alternative criteria for the transition to high school, teachers offered that students should be carefully observed and guided by their teachers from the beginning of secondary school and directed towards the correct type of high school they will best fit in. This finding matches the education policy expectations of DP (2019) and VFO (2021). For this, teachers offered to administer different types of tests for different high schools. Many other teachers also suggested that process evaluation should be more valuable and worthwhile. Some salient studies on process evaluation suggest that when students practice self-assessment, they are more effective in improving their writing skills (Cömert & Kutlu, 2018), and electronic portfolio applications improve students' research skills and their attitudes and interests toward research (Polat Demir & Kutlu, 2016). Giving teachers more autonomy to decide about children's future lives will make the teaching profession more valuable and honorable and help teachers focus more on the learning-teaching process than evaluation and objectives. Echoing Berliner (2011), the twenty-first-century economy will require a broad set of skills from the workforce, not a narrow one. Thus, diversity in the knowledge possessed by students ought to be among the goals of national educational systems. As one foreign language teacher said, "When teachers are more autonomous and

do not feel under stress, they will be more fair towards kids. Teachers are the key players in this game, and they are the ones who know their students' strengths and weaknesses, so they can truly direct their students toward the right type of career paths." Other teachers also suggested that student portfolios or projects should be valuable assets in deciding the type of high school students will enroll in. Policymakers could actualize all these teachers' suggestions to better align the commitments stated in educational policy documents with authentic assessment practices.

Regarding the impact of managers and families on the success or failure of students on the LGS exam, teachers commented that families put pressure on their kids to become more successful, creating anxiety for both the students and the teachers. In this case, the pressure directed toward children and teachers will lower both parties' motivation. As Roth et al. (2007) claim, teachers become technicians when pressure comes from the authorities, only transferring knowledge to be asked in tests and leaving aside active teaching methodologies. Thus, as Semerci and Batdi (2015) suggest, providing autonomy-rich environments to teachers who will make fair value judgments is better.

Conclusion

It is important to harmonize educational policies with actual implementations and the reality of schools. Although national policy documents stress individual growth, personal development, and skills, overemphasizing high-stakes tests still dominates the Turkish evaluation system, especially among education levels. Even students of prestigious schools feel the need to go to a particular course to excel at multiple-choice tests before their transit among education levels so that they could get higher scores and be enrolled in a better high school, which then will provide an additional benefit in the transit test to the university level. However, this not only contradicts the expectations of the national policy documents but also goes on to create inequality among poor and wealthy students. In addition, the motto of assessment should be kept in mind: "Test what you teach and how you teach it" while emphasizing tests. Suppose the system turns into "Teach what you test and how you test it," as is the case for high-stakes transit tests. In that case, there is the threat that curricula, course books, and learning-teaching processes will be ignored. Instead, testing will be the single determiner of the education process, contradicting Turkey's education policy documents. As Nichols and Berliner (2007) state, when the young generation puts too much emphasis on external rewards, teachers risk having a young population that does not enjoy learning for its own sake and always expects external stimuli for its own sake.

Limitations

The findings of this study are limited to data gathered from 109 secondary school teachers and their opinions in Ankara, Turkey. Although the data set is large in total, it does not represent the whole population of Turkey. However, the results shed important light on the limitations and negative consequences of high-stakes tests for the transition among education levels and the discrepancy between education policy documents and actual implementations.

Author (s) Contribution Rate

The writer of this article is the sole writer.

Conflicts of Interest

There is no conflict of interest.

Ethical Approval (only for necessary papers)

Permissions for conducting research were granted from the Ankara Provincial Directorate of National Education and TED University Ethics Committee (no: E-27535802-100-13170).

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Prospective Classroom Teachers' Reasons for Choosing the Teaching Profession and Their Preferences for Their Work Lives

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Prospective Classroom Teachers' Reasons for Choosing the Teaching Profession and Their Preferences for Their Work Lives

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Abstract

This research examined the factors that affect the decision of prospective classroom teachers to choose teaching as a profession and their preferences regarding work-life balance. A case study design, one of the qualitative research methods employed in this study, The participants consisted of 20 prospective classroom teachers who took the teaching practice course in the 2021–2022 academic year at a state university. A semi-structured interview form was used for data collection, and the data was analyzed through content analysis. Findings revealed that prospective classroom teachers' preference for the profession is influenced by their love for the profession, working conditions, the love and interest shown by their former teachers, and communication with children. Their preferences are also influenced by their discovery that they can teach children something, their desire to contribute to the development of future generations by serving people in the basic education stage, their families' supportive behaviors, and their experiences of the profession in their university years. In terms of their preferences for their work lives, most of the teacher candidates expressed a desire to become classroom teachers and work in this field, while it was found that some teacher candidates experienced dilemmas regarding their work lives due to studying or working in different fields. This research emphasizes the need to improve working conditions for teachers and develop teacher training programs that focus on teacher candidates' affective aspects.

Keywords: Teacher, Classroom teacher, Profession, Career choice

Introduction

One of the greatest challenges in industrialized societies is career choice due to the limited observation and experience opportunities for individuals to become acquainted with different professions. Individuals who work in crowded workplaces today carry out their tasks without seeing the whole production process. In such a society, parents have limited opportunities to introduce their children to various professions. Choosing one's profession freely is a necessary aspect of being a contemporary individual (Kuzgun, 2017). The choice of profession is one of an individual's most important decisions, which is difficult due to the large number of professions. Deciding on an appropriate profession in which individuals can realize and develop themselves is important (Tuzcuoğlu, 1994). In career decisions, many interrelated factors and conditions are at play (Kuzgun, 2017). Career choice means the choice of a way of life for individuals. Profession determines with whom an individual will communicate and defines the framework of their life (Dardağan and Hesapçıoğlu, 1997). The definition of the concept of the profession needs to be examined here.

According to Kuzgun (2019), "a profession is a set of activities based on systematic knowledge and skills acquired through specific education, established by society's rules, to produce useful goods or services for people and earn money in return" (p. 2). Although earning a livelihood is one aspect of the definition of a profession, it is not the only reason. The essence of a profession is to satisfy oneself by using hidden powers to produce something. Since professions are categorized based on the level of education and the nature of the professional task, professions based on university education are expert professions (Kuzgun, 2019). Teaching is a profession that requires a high level of competence and carries responsibility for human life (Ministry of National Education, 2017). Education is a requirement to keep pace with the developing world. One of the crucial elements of the education system in contemporary societies is the need for teachers to be trained to meet changing social processes with appropriate quality and quantity (Aslan et al., 2012). Despite the quality of the

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objectives and content of education and teaching, the lack of adequate qualifications among teachers, who guide the realization of these objectives, causes a failure to achieve the expected developments in education (Sünbül, 2003).

Teachers contribute to the development of individuals and help shape the future and the world. According to UIS Director Silvia Monto, the quality of education systems depends on teachers, who need education, resources, and support to perform their jobs well (UNESCO, 2016). As in other professions, the process of selecting to be a teacher starts with enthusiasm for the desired profession, followed by the qualities required and opportunities provided by the profession, which shape the career choices. This in turn leads to commitment to the profession when the requirements of the chosen profession are met (Kuzgun, 2019).

In examining the reasons why teachers choose their profession in various studies, Yurdakal (2019) has put forward the working conditions of the family and environment. Buldur and Bulsal (2015) determined that the preference for teaching as an ideal profession was altruistic. Yılmaz and Doğan (2015) found that the most important factor in determining career choices was their harmony with the individuals' personalities and a satisfactory placement score. When examined in terms of internal and external factors, Buldur et al. (2021) found that internal factors were more dominant. Koşar (2018) categorized the reasons for choosing the teaching profession. The intrinsic factors include a love for children, compatibility with personality, leadership, and lifelong learning, while the extrinsic factors include the sanctity of the profession, service to society, social status, modeling, family, and score. Bergmark et al. (2018) found that multiple motivations, previous school experiences, and newly established pedagogical identities were crucial for teacher training and career choices. While Yüce et al. (2013) identified external, internal, and altruistic motivations that influenced teacher candidates' decisions to become teachers, they found that external and altruistic motivations were more influential, followed by internal motivations. In their study conducted on teacher candidates in Ireland, Hennessy and Lynch (2017) identified learning and teaching experiences and perceived abilities as the most influential factors in choosing the teaching profession. Unlike other countries, the study revealed that the strong influence of learning and teaching experiences in the country in question was due to its subject-based knowledge transfer. Keck Frei et al. (2017) concluded that working with children and young people was the most important predictor of choosing the teaching profession as a career for males. Mankki and Kyrö-Ämmälä (2021) found that the most demotivating reasons for teacher candidates before their entry into the profession were the difficulties of being accepted, the challenges of the profession, limited career opportunities, the dilemma of vocational programs offering insufficient diversity, insecure careers, and the media as a source of demotivation. Mašková et al. (2022) found that the highest motivation category was a love for children and a desire to work with them, followed by supporting the education journey of others, the meaningfulness of the teaching profession, the perception of it as a secure profession, its ability to make a social contribution, and a love for the profession. The current study seeks to uncover additional and distinct categories to understand the reasons why teacher candidates choose the teaching profession. Understanding the reasons for choosing the teaching profession is crucial for determining the programs of education faculties and the attitudes of teacher candidates towards the profession. The results obtained from existing and future studies are important in determining where Turkey stands internationally in terms of career choices.

The teaching profession, unlike many other professions, involves constant communication and interaction with people. While teachers have formal relationships with their students defined by laws and regulations, these relationships are primarily emotional in nature. This is why everyone has an unforgettable teacher, usually their first teacher (Çelikten et al. 2005). This study aims to identify the reasons why classroom teacher candidates choose the teaching profession and their preferences regarding their working lives. To this end, the following questions guided the current study:

1. What are the reasons for prospective classroom teachers to choose the teaching profession?
2. What are the preferences of prospective teacher candidates regarding their working lives?

Method

Research Model

The qualitative research method was used to determine the reasons for prospective classroom teacher candidates' preference for the teaching profession and their preferences for their working lives. Qualitative research aims to examine how people make sense of their lives. In this process, a deductive approach, from specific to general, is followed, and the findings resulting from qualitative research are supported by excerpts from participant data, demonstrating a highly explanatory structure (Merriam, 2013). A case study design was used in the current research. In case studies, a deep focus is placed on revealing the topics covered in the scope and providing clarity in the understanding of situations (Yin, 2017), and one of the most important features of case studies is the limitation of the situation (Merriam, 2013).

The current research was approved by the ethics committee of Firat University Social and Human Sciences Research Ethics Committee, with meeting number 2022/09 and decision number 08, on May 6, 2022. The necessary permissions were obtained from the deanery of the university's education faculty for the implementation of the research.

Study Group

Purposive sampling was used in the current study. According to Patton (2018), purposive sampling aims to provide an in-depth and insightful understanding of rich cases to achieve the main objective of the research. Combining methods in research enhances the strength of the study by providing variation.
The current research used two types of purposive sampling, namely criterion sampling and maximum variation sampling.
Examining and evaluating all cases that satisfy pre-determined criteria of importance is known as criterion sampling (Patton, 2018). In this study, the criteria were 4th-grade level education and having taken the teaching practice course. To achieve maximum variation from a small sample, various qualities and criteria are identified to begin with (Patton, 2018).
For the study group, various matrices were determined, including gender, age, foreign nationality, and grade average. Teacher candidates were selected according to these matrices and their other characteristics, such as major and work experience. The study group consisted of 20 prospective classroom teachers who took the teaching practice course in the 2021–2022 academic year at a state university. Table 1 provides the characteristics of the teacher candidates included in the study group.

Table 1. The characteristics of the prospective classroom teachers

Participant	Gender	Birth	Grade Average	Foreign nationality	Working	Studying in different major
MS1	Female	1992	3.79	No	Yes	Yes
MS2	Female	1996	3.12	No	No	Yes
MS3	Male	2000	3.02	No	Yes	Yes
MS4	Female	1996	3.35	No	No	No
MS5	Female	1998	3.06	No	No	No
MS6	Female	1998	3.52	No	No	No
MS7	Male	1999	2.74	No	Yes	No
MS8	Female	2000	3.30	No	No	Yes
MS9	Male	1998	3.03	No	No	Yes
MS10	Male	1998	3.04	No	No	No
MS11	Male	1998	3.13	No	No	No
MS12	Female	2000	2.66	No	No	No
MS13	Male	2000	3.60	No	No	No
MS14	Female	1999	2.46	No	No	No
MS15	Female	1998	2.50	Yes	No	No
MS16	Male	1999	3.52	No	No	No
MS17	Female	2001	3.00	No	No	No
MS18	Female	1998	2.59	Yes	No	No
MS19	Male	1999	2.72	No	No	No
MS20	Female	2000	3.72	No	Yes	Yes

Table 1 shows that there are 12 female and 8 male teacher candidates according to the gender matrix. The percentage of male teacher candidates in the 4th-grade teacher training program is 24%. However, in this study, this ratio was determined to be 40%, considering other matrices. In terms of age, students were selected for the study group according to their ages in the program. The highest birth year in the program is 1992, while the lowest is 2001. There are two teacher candidates born in 1996, seven born in 1998, four born in 1999, and five born in 2000, as well as two foreign students and three teacher candidates who work a continuous job. Six teacher candidates studying in a different department are also included in the study group.

Data Collection Instrument

The semi-structured interview approach was used as a data collection tool in the research.
Research questions form the basis of qualitative research and are created in two ways: primary and related questions. In a study, one or two primary questions may be identified. Primary questions are generally worded in a general manner without restricting participants' opinions. These primary questions can be followed by sub-

questions (Creswell, 2017a). The interview form ensures the scope of all dimensions and questions related to the research problem, adhering to the predetermined topics or areas of the research problem (Yildirim & Şimşek, 2021). In this research, the interview form used as a data collection tool includes 11 open-ended questions on topics related to the research problem. The number of questions set in the form is also within the recommended limit for qualitative research. These questions' topics include prospective teachers' preferences for their future work life, reasons for choosing the profession such as loving the profession, working conditions, teachers they encounter, ÖSYM-YÖS scores, love for children, passion for learning and teaching, service to people, general and special talents, family, and other factors. Prospective teachers were asked to evaluate these specified topics. Every question in the research was developed after examining the relevant literature and gathering the opinions of elementary school teachers, prospective elementary school teachers, and experts in the field.

Data Collection and Data Analysis

In the research process, the data collection process began by providing information about the research to the identified participants. The time and place for the interviews were pre-planned. A volunteer form was used to obtain the necessary permissions from the participating teacher candidates. Data was collected through face-to-face interviews, which lasted a minimum of 14 minutes and a maximum of 40 minutes, with an average duration of 25 minutes for all participants. The interviews were recorded, and codes were used to identify participants without revealing their identities. Content analysis was employed to analyze the data, which involves reducing and interpreting the qualitative data to identify key consistencies and meanings (Patton, 2018).

The research analysis followed Creswell's (2017b) established steps for data analysis. First, the interview data was transcribed into digital text for the analysis, which was conducted with qualitative data analysis software. The data was read repeatedly, broken down into sections, and coded. A simplified coding approach was used instead of numerous codes, and the codes were categorized thematically. The codes were reviewed with a second coder to address inconsistencies, and both natural and theory-based codes were used. According to Creswell (2017b), natural codes rely on the words and phrases used by the participants during the interview, and excerpts were included in the research to reflect the essence of the participants' thoughts.

Findings

The first research question was related to the determination of the reasons why prospective class teachers choose the teaching profession, and sub-questions were formulated to address this question. Table 2 provides the answer to the first sub-question of the study, which is the effect of loving the profession on the decision of teacher candidates to choose teaching as a profession. Two themes were identified for this theme: "effect of loving the profession "and "no effect of loving the profession". The former theme included the following codes: "Ability to do the job, benefit, children, doing paid teaching, modeling, and negative modeling." The latter theme included the following codes: " lack of communication with children; not differentiating the major; choosing a different profession; rational choice". 14 participants expressed their views under the theme of the effect of loving the profession, while 6 participants expressed their views under the theme of no effect of loving the profession.

Table 2. Effect of loving the profession

	Themes-Codes	Participants
Theme	Effect of loving the profession	MS1, MS2, MS3, MS4, MS5, MS6, MS7, MS12, MS13, MS15, MS16, MS18, MS19, MS20
Codes for the effect of loving the profession	Ability to do the job	MS2, MS3, MS7, MS13, MS15, MS16, MS18, MS20
	Benefit	MS4, MS19
	Children	MS1, MS2, MS4, MS5, MS7, MS12, MS15, MS16, MS18, MS19, MS20
	Doing paid teaching	MS1
	Modeling	MS4, MS6, MS7, MS13, MS18
	Negative modeling	MS15
Theme	No effect of liking the profession	MS8, MS9, MS10, MS11, MS14, MS17
Codes for no effect of loving the profession	Lack of communication with children	MS14
	Not differentiating the major	MS10, MS11, MS17
	Choosing a different profession	MS9
	Rational choice	MS8, MS9, MS14

Regarding the "children" code under the theme of the effect of loving the profession, teacher candidates expressed the following views:
MS16: "Teaching is a very important profession. We need to love the profession. I chose teaching because I am aware of this and I love the profession. Teaching can provide us with the environment to love children. We need to love children as well."
MS20: "The reason why I love the profession is primarily because of children. We will be in contact with them throughout the profession."
The following views have been expressed regarding the "modelling" code:
MS6: "The way my mother taught me the lessons and how helpful it was for me inspired me to show the same thing to my siblings, and I realized that I could transfer and share my knowledge. My love for teaching started like this."
MS4: "Actually, primary school had a bit of an impact on me. I loved my class teacher very much. You know how a person can have an idol or a role model? She was my idol. That had an impact.
The following views have been expressed regarding the "benefit" code:
MS19: "Another factor was that I wanted to choose this profession to raise conscious and beneficial individuals to society, or rather, to our future society, who are both beneficial to themselves and their environment, and to raise individuals who have good morals."
Regarding the no effect of loving the profession theme, the following views have been expressed under the "not differentiating the major" code:
MS17: "I don't think I made a very conscious choice before choosing this profession. Firstly, I chose to go wherever the score from the university entrance exam took me."
MS10: "When I was making my choice, I didn't have any knowledge about teaching in a classroom. Or, to put it more accurately, it didn't matter to me whether it was teaching in a classroom or another field."
Under the "lack of communication with children" code, the following opinion has been expressed:
MS14: "...since there were no young children in my family and everything was according to what I said, I couldn't tolerate a child's voice, so I didn't choose to become a classroom teacher, but it was an unconscious decision since I am young."
According to Table 3, there are two themes named "affected working conditions" and "unaffected working conditions" regarding the influence of working conditions on the career choices of prospective classroom teachers. Under the affected conditions theme, the following codes were constructed: "family life, no subordinate-superior relationship, employment, gender, economic benefits, different places of residence, open to development, peaceful profession, readiness for the profession, social profession, status, holidays, working hours, working with children, employee rights." Under the unaffected conditions theme, the following codes were constructed: "Gender, economic factors, desire for a different profession, different places of residence, working hours".

Table 3. The effects of working conditions in the profession

Themes-Codes		Participants
Theme	Affected Conditions	MS1, MS2, MS3, MS4, MS5, MS6, MS7, MS8, MS9, MS10, MS11, MS12, MS16, MS17, MS18, MS19, MS20
Affected Working Conditions Codes	Family life	MS4, MS7, MS8, MS10
	No subordinate-superior relationship	MS19
	Employment	MS2, MS8, MS12, MS17
	Gender	MS5, MS17, MS20
	Economic benefits	MS1, MS3, MS4, MS5
	Different places of residence	MS16, MS20
	Open to development	MS6, MS10, MS18
	Peaceful profession	MS8, MS9
	Readiness for profession	MS5
	Social profession	MS2, MS6
	Status	MS4, MS6
	Holidays	MS1, MS4, MS5, MS6, MS8, MS9, MS11, MS12, MS17, MS19, MS20
	Working hours	MS4, MS5, MS7, MS8, MS10, MS17, MS18, MS19, MS20
	Working with children	MS2, MS4, MS6
	Employee rights	MS1
Theme	Unaffected Conditions	MS3, MS6, MS7, MS9, MS10, MS11, MS13, MS14, MS15, MS16, MS17, MS18

Unaffected Working Conditions Codes	Gender	MS6
	Economic factors	MS9, MS10, MS11, MS13, MS16, MS17, MS18
	Desire for a different profession	MS14
	Different places of residence	MS3, MS15
	Working hours	MS13, MS16

Teacher candidates expressed their opinions about some conditions being effective and some conditions being ineffective in the working conditions of the profession; they were coded under both themes. The reason for this is that teacher candidates expressed their opinions in both the affected and unaffected conditions themes. Teacher candidates mostly expressed their views on the holiday code under the affected conditions theme. Under the unaffected conditions theme, they mostly expressed their views on economic factors. The following are some of the views expressed regarding the holiday code under the affected conditions theme:

MS9: "There is an attractive side to teachers having more holidays..."
MS11: "You work on weekdays and don't work on weekends. Besides, I have a 3-month vacation. These kinds of effects also have a positive effect, and they played an influential role in my choice of this profession."
Regarding the "gender" code under the affected conditions theme, the following are some of the views expressed:
MS20: "I think teaching is the best profession for women. The advantages provided to female teachers in working conditions are also very useful, and being a school, being an institution, it is a little more protected environment."
MS5: "I think it is a profession that is more suitable for women."
The views on the economic benefits code under the affected working conditions theme are as follows:
In MS3, it says, "Of course you do it because you enjoy it, but the salary is important to make a living."
In MS1, "I compared the salary of a paid teacher with that of a regularly appointed teacher. That's where I was economically affected."
Under the theme of unaffected working conditions, the following opinions were expressed in the economic factors code:
In MS18: "I never thought about the economic impact."
In MS13: "Also, there is not a particularly high amount compared to other professions economically, so these factors did not influence my preference."
Under the theme of unaffected working conditions and the desire for different professions, the following opinions were expressed in the code:
In MS14: "I had never even thought about it because it wasn't in my plan. There are summer and February vacations; I will work half a day, and I can spend time with my family and my home. Those criteria didn't even come to mind. Because that wasn't my plan. I wanted to study law."

Table 4 shows three themes for the question "What is the impact of teachers choosing the teaching profession?". Under the "positive example" theme, the following codes emerged: "conformity, support, influence, love-interest, raising, and guidance". Under the "negative example" theme, there are "negative behaviors, no response to problems, constant change, distance, and "lack of communication" codes. Under the theme of no teacher effect, only one student expressed an opinion.

Table 4. Effects of (former) teachers on choosing the teaching profession

Themes-Codes		Participants
Theme	Positive Example	MS2, MS3, MS4, MS7, MS8, MS9, MS10, MS11, MS12, MS13, MS15, MS16, MS17, MS18, MS19, MS20
Positive Examples Codes	Conformity	MS20
	Support	MS8, MS12, MS15, MS16
	Influence	MS4, MS8, MS16, MS17, MS18, MS19
	Love-Interest	MS2, MS3, MS4, MS8, MS9, MS10, MS11, MS12, MS13, MS15, MS16, MS17, MS18, MS19, MS20
	Raising	MS12, MS17, MS19
	Guidance	MS3, MS8, MS9, MS10, MS12, MS16
Theme Negative Example Codes	Negative Example	MS1, MS6, MS13, MS14, MS15, MS20
	Negative behaviors	MS1, MS14, MS15
	No response to problems	MS13, MS14
	Constant change	MS20
	Distance	MS6, MS14
	Lack of communication	MS6, MS20

Theme	No Effect of Teacher	MS5

Since teacher candidates expressed their opinions on both positive and negative example themes, their opinions are found in both themes. The most commonly expressed code under the positive example theme is "love-interest," while under the negative example theme, the "negative behaviors" code is found. Under the positive example theme, the opinions regarding the "love-interest" code are:

In MS2: "Of course, it happened. We loved our classroom teacher, and our connection was very strong. So, I've always wanted to be a teacher since then."
In MS4: "Our teacher was like a child with us, playing games and being like us, so she didn't just teach us and leave. When we had a problem or something, she was always interested in us. So her influence is a factor in my choosing the teaching profession."
The opinions of the participants on the "guidance" code under the positive example theme are as follows:
MS12: "I talked about it during the preference period. Can I do it? You have known me since my childhood, and you are in contact with my family. Am I suitable for this profession? I talked with her about it. She was very happy about my choice, and when she said I could do it and it would be suitable for me, I leaned towards this profession."
MS3: "Thanks to my classroom teacher, he helped me a lot in taking this profession. I thought I could do it in the best way after seeing him. Can I do it? Yes, I can do it in the best way." I came to this conclusion by making a self-assessment".
The opinions of the participants on the "conformity" code under the positive example theme are presented below:
"Of course, like everyone else, my classroom teacher has had a great influence on me in choosing this profession. When I remember him and the other students, I usually associate this profession with memories from those times. For example, we had done this in first grade, and we had done that in second grade, and I make connections to those times."
Opinions on the negative behavior code under the negative example theme are as follows:
In MS1, "I said to myself that I would be a teacher, not like them. On the contrary, I will be a teacher who understands children. So, I was influenced by how I can turn a little negative into a little positive and chose this profession."
MS14: "Some students are affected by their teachers and say we'll be teachers like you in the future. This is not the case in my situation."
The following are the opinions of only one participant under the "no effect of the teacher" theme:
In MS5, "I thought entirely about myself. I did not have a teacher who had a great influence on my life. My class teacher did not have much influence."

According to Table 5, two themes named "loving classroom teaching" and "preference" were created regarding the effect of ÖSYM-YÖS exam scores on choosing the teaching profession. Under the theme of "not liking classroom teaching," 8 people expressed their opinions; under the theme of "preference," 12 people expressed their opinions. Under the "loving classroom teaching theme, goal-oriented work and the only preference as a profession are the codes. Under the preference theme, the following are the determined codes: dilemma in departmental choice, choosing a department outside of the goal, horizontal transition, preference according to a high score, the dilemma in choosing teaching departments, and second choice preference".

Table 5. Effects of ÖSYM-YÖS Exam Scores

	Themes-Codes	Participants
Theme	Loving Classroom Teaching	MS2, MS3, MS4, MS6, MS15, MS16, MS19, MS20
Loving Classroom Teaching Codes	Goal-oriented work	MS6, MS16, MS19
	The only preference as a profession	MS2, MS3, MS4, MS15, MS20
Theme	Preference	MS1, MS5, MS7, MS8, MS9, MS10, MS11, MS12, MS13, MS14, MS17, MS18
Preference Codes	Dilemma in departmental choice	MS7, MS18
	Choosing a department outside of the goal	MS17
	Horizontal transition	MS9
	Preference according to a high score	MS11, MS14
	Dilemma in choosing teaching departments	MS1, MS8, MS10
	Second choice preference	MS5, MS12, MS13

Under the theme of loving classroom teaching, the most frequent code is "the only preference as a profession," whereas under the "preference" theme, the most frequent codes are Dilemma in departmental choice and Second choice preference. The views of participants on loving classroom teaching are as follows:

MS15: "They told me to choose engineering or another department because, like, there are more opportunities to work in them. For example, being a doctor can be a good choice. Because my score was already high, but I said no. I chose to be a classroom teacher."
MS2: "I chose to become a classroom teacher just because I love it. My choice had nothing to do with my high exam score."
Some of the participants' opinions on the "Dilemma in choosing teaching departments " code under the preference theme are as follows:
MS1: "I had a high score, so my score was already enough. I was undecided between preschool and classroom teaching. Then, I think my previous experiences had little influence. I chose classroom teaching."
MS8: "My goals were bigger, and I came here with the influence of the score I received. Turkish language teaching was ahead of other teaching departments in general."
Regarding the preference according to a high score, MS14 stated, "At that time, the best department that I could enter with my score was classroom teaching."

According to Table 6, three themes were created on the effect of loving children on choosing the teaching profession for classroom teacher candidates. Under the "communication with children" theme, the following codes emerged: understanding, caring for children, wonder in children, siblings, and desire to work with children. Under the "education targeting children" theme, two codes emerged: "teaching" and "raising children." Under the "no effect of loving children" theme, there is a code called "not being used to children." Teacher candidates expressed their views on both themes of "communication with children" and "education targeting children" and were therefore coded in both themes.

Table 6. The effect of loving children

Themes-codes		Participants
Theme	Communication with children	MS1, MS4, MS5, MS6, MS7, MS8, MS9, MS10, MS12, MS13, MS15, MS16, MS18, MS19, MS20
Communication with children Codes	Understanding	MS1, MS6, MS12, MS13, MS15, MS20
	Caring for children	MS5, MS9, MS10, MS12, MS16, MS19
	Wonder in children	MS8, MS10
	Siblings	MS6, MS7, MS12, MS15, MS19
	Desire to work with children	MS16, MS18
Theme	Education targeting children	MS1, MS2, MS3, MS5, MS6, MS7, MS8, MS9, MS10, MS11, MS13, MS15, MS17, MS19, MS20
Education targeting children Codes	Teaching	MS1, MS2, MS3, MS5, MS6, MS7, MS8, MS9, MS10, MS11, MS13, MS15
	Raising Children	MS7, MS15, MS17, MS19, MS20
Theme	No effect of loving children	MS14
No Effect of Loving Children's Codes	Not being used to children	MS14

In the theme of communication with children, the most prevalent views are on "caring for children" and "communication with children". In terms of education targeting children, opinions have been expressed on the codes of "teaching" and "raising children".
MS15: "I love children very much. My relationship with them is very good; I can communicate with them."
MS6: "I get along well with children; I love them, and my profession already requires it."
In the theme of communication with children, there are views on the code of "siblings":
MS19: "I have a little brother who affected me. When I entered the department, my brother was about 2 years old."
MS12: "I was always surrounded by children. We were seven siblings. Actually, our home was always like a children's home, there were always young children around."
In terms of education targeting children, there are views on the code of "teaching":
MS3: "As far as teaching is concerned, since my childhood, I have always taught and shown things to my siblings and cousins."
MS7: "I used to help my siblings in their lessons, activities, and performances. Seeing my brother's excitement when he learned to count was great."
Regarding the no effect of loving children code, a participant's view is below:

MS14: "When I chose my profession, my love for children had no effect, as there were no young children in my family and I am not accustomed to children around me in my family."

Table 7 shows the themes and codes for the impact of passion for learning and teaching on the preferences of prospective classroom teachers in choosing their profession. The following themes emerged: Emotion, discovering that I can teach, reflection, research, problem-solving, love for reading, leadership, social impact And learning to teach. The code of "unawareness" emerged under the no-effect theme.

Table 7. The effect of teaching-learning passion

Themes-codes		Participants
Theme		MS1, MS2, MS3, MS4, MS5, MS6, MS7, MS8, MS9,
	Desire to teach-learn	MS10, MS11, MS12, MS13, MS15, MS16, MS18, MS19, MS20
	Emotion	MS4, MS5, MS6, MS7, MS8, MS9, MS10, MS16, MS19
	Discovering that I can teach	MS1, MS3, MS4, MS7, MS8, MS10, MS11, MS12, MS13, MS16, MS19, MS20
	Reflection	MS4, MS12
Desire to teach-learn codes	Research	MS1, MS6, MS8, MS11, MS16, MS20
	Problem-solving	MS6
	Love for reading	MS1, MS6, MS11, MS18
	Leadership	MS7
	Social impact	MS9, MS16, MS20
	Learning to teach	MS20
Theme	No effect	MS14, MS17
No effect codes	Unawareness	MS17

Under the desire to teach-learn theme, the code "discovering that one can teach" was expressed the most. Under the no-effect theme, a prospective teacher expressed the code "unawareness." Regarding the views on the "discovering that I can teach" code, the following participants' excerpts exemplify the case:

MS4: "My siblings had an influence. My siblings would come and ask questions, and that had an impact on me. My uncle's children were in grades 2 and 3, and I started teaching them. That was when I realized that it was nice to teach someone something. That was when I discovered it.
MS16: "I can say that I discovered that I could teach both while playing games and while teaching games. Of course, this reached an even higher level in high school. I gained experience at a young age."
Regarding the views of teacher candidates on the "emotion" code, the following excerpts can be given:
MS10: "When students respond to you when they learn, you feel happy and feel that you have done something."
MS5: "It is a really nice feeling to be able to convey something to the person in front of you and to pass something on to them."
Regarding the "research" code, the following participants' excerpts can illustrate the case:
MS16: "Classroom teachers should not stop learning new things. They need to study and research their areas, and I have also conducted a lot of research. I received support and talked to relevant teachers. I think this is necessary."
MS8: "I love learning, and I love doing research."
Regarding the code "unawareness" under the "no effect" theme, the following excerpt can be given:
MS17: "After starting my internship, I realized that I also have something for teaching after the process I went through in the faculty. When I think about the past, I notice it. Actually, I became aware of it then; I was not aware of it before. To be honest, I realized it during the process."

According to Table 8, three themes were identified for pre-service teachers in choosing their profession based on the effect of serving others: serving the community, serving the future, and no effect. Under the "serving society" theme, there are codes including sharing, assuming responsibility, benefit, serving the country, and values skills. Under the "serving the future" theme, the following codes emerged: influencing, raising the next generation, shaping life, and basic education. The pre-service classroom teacher who is in the "no effect" theme was coded as having no effect on questions about their choice of future profession except for the influence of family. Since pre-service classroom teachers expressed their opinions on both the "serving society" and "serving the future" themes and their sub-codes, they were coded in both themes and sub-codes.

Table 8. The effect of serving the people

Themes-Codes		Participants
Theme	Serving the Community	MS1, MS2, MS3, MS6, MS7, MS8, MS9, MS10, MS11, MS12, MS13, MS16, MS17, MS18, MS19, MS20
Serving the community Codes	Sharing	MS6
	Assuming responsibility	MS8, MS16
	Benefit	MS1, MS3, MS7, MS8, MS9, MS10, MS11, MS16, MS17, MS18, MS19, MS20
	Serving the country	MS2, MS7, MS8, MS12, MS16
	Values-Skills	MS12, MS13, MS19
Theme	Serving the Future	MS2, MS3, MS4, MS5, MS7, MS8, MS9, MS10, MS12, MS13, MS15, MS17, MS19
Serving the future Codes	Influencing	MS8, MS9
	Raising the next generation	MS7, MS8, MS10, MS12, MS13, MS15, MS19
	Shaping life	MS3, MS5, MS7, MS10, MS17
	Basic education	MS2, MS3, MS4, MS5, MS7, MS9, MS10, MS12, MS17
Theme	No effect.	MS14

The most commonly expressed code regarding "serving the community" is "benefit", while in the theme of "serving the future", the code is "basic education". Regarding the "benefit" code, the opinions of teacher candidates are as follows:

MS19: "I do not think there is a more useful profession, nor do I think there is one."

MS10: "If you want to make a difference in society, if you want everything to be better, it starts with primary education."

Regarding the "serving the country" code, the opinions of teacher candidates are as follows:

MS2: "I want to serve my country in any way, wherever and however it may be. This has a very big impact."

MS8: "I am a citizen of this country, as are many of our heroes who served this country in some way, and I believe that I also need to serve them."

The opinions on the "basic education" code under the theme of "serving the future" are as follows:

MS9: "You cannot have much of an impact on a high school student. Their personalities are already formed during adolescence, yes, but after a certain point, you can't have much of an effect. But I chose to become a classroom teacher because I think we can have more of an impact on elementary school children."

MS7: "You will be teaching 30 people, and you will be educating them all at once, maybe up to four. You will be creating a fundamental character and temperament in the student."

The opinions on the "raising the next generation" code are as follows:

MS13: "Actually, by raising future generations, we are also serving them. I chose this profession with awareness of this."

MS10: "If you raise 40 students well, then these 40 students will go on to raise more in their lifetime. They will raise different people, and thus society will improve. You can serve one person outside, but you will be serving 40 people there. You should think that those 40 people can serve 40 more people."

According to Table 9, two themes have been identified for class teacher candidates' preference for the profession in terms of general and specific abilities: "has an effect" and "no effect". Fifteen teacher candidates expressed their opinion that their general and specific abilities have an effect, while five stated that they have no effect. The "have an effect" theme includes codes such as "patience", "empathy", "communication", "teaching", "problem-solving", "persuasion", "creativity", "observation", "leadership", and "art language". The "no effect" theme includes the code "not believing oneself to be talented".

Table 9. The Effects of General and Specific Abilities

Themes-codes		Participants
Theme	Has an effect	MS1, MS3, MS5, MS6, MS7, MS8, MS9, MS10, MS12, MS13, MS15, MS16, MS17, MS19, MS20
Has Effect Codes	Patience	MS1, MS3
	Empathy	MS1, MS9
	Communication	MS1, MS6, MS7, MS8, MS9, MS12, MS15, MS16, MS17
	Teaching	MS3, MS6, MS8, MS10, MS13, MS19

		Problem-solving	MS5, MS7, MS8, MS15
		Persuasion	MS6
		Creativity	MS6, MS8
		Observation	MS7, MS16
		Leadership	MS7
		Art-Language	MS20
Theme		No effect:	MS2, MS4, MS11, MS14, MS18
No Codes	Effect	Not believing to be talented	MS2, MS11

Under the desire to teach-learn theme, the code "discovering that one can teach" was expressed the most. Under the no-effect theme, a prospective teacher expressed the code "unawareness." Regarding the views on the "discovering that I can teach" code, the following participants' excerpts exemplify the case:
MS4: "My siblings had an influence. My siblings would come and ask questions, and that had an impact on me. My uncle's children were in grades 2 and 3, and I started teaching them. That was when I realized that it was nice to teach someone something. That was when I discovered it.
MS16: "I can say that I discovered that I could teach both while playing games and while teaching games. Of course, this reached an even higher level in high school. I gained experience at a young age."
Regarding the views of teacher candidates on the "emotion" code, the following excerpts can be given:
MS10: "When students respond to you when they learn, you feel happy and feel that you have done something."
MS5: "It is a really nice feeling to be able to convey something to the person in front of you and to pass something on to them."
The opinions regarding the "problem-solving" code are as follows:
MS8: "Although teaching may seem like a monotonous profession, there may be situations that require sudden solutions in people. I think I am capable of producing sudden solutions."
MS15: "Don't go for an immediate solution."
Opinions related to the "not believing to be talented" code under the no effect theme are as follows:
MS2: "I don't really think I'm very talented in this regard."
MS11: "I don't have any special talents."
The opinion of the teacher candidate regarding the "art-language" code is as follows:
MS20: "I think I have talent in all areas, such as painting, music, dance, and language."

According to Table 10, three themes, "supportive," "personal decision," and "family preference," were created for the influence of family on choosing the profession of classroom teacher candidates. While the "mother" and "father" codes are under the "supportive" theme, the code " choosing a major difference from the family's desire" is under the "own decision" theme, and the "relatives" and "father" codes are under the "family preference"theme.

Table 10. Effects of parents

Themes-codes			Participants
Theme		Supportive	MS1, MS3, MS4, MS5, MS6, MS9, MS13, MS15, MS16, MS18, MS19, MS20
Supportive Codes		Mother	MS3, MS6, MS9, MS16
		Father	MS1, MS4, MS5
Theme		Own decision	MS2, MS7, MS10, MS11, MS12, MS17
Personal Codes	decision	Choosing a major different from the family's desire	MS11, MS12
Theme		Family preference	MS8, MS14
Family Codes	preference	Relatives	MS8
		Father	MS14

The "mother" code is the most commonly expressed view under the "supportive" theme. The opinions of teacher candidates regarding the mother code are as follows:
MS16: "My mother has contributed greatly to my life. She always wanted me to become a teacher, of course. I cannot say that my family did not have a great influence on my decision to choose this department. Of course, it was also my own desire, but I can say that my family supported me a lot."
MS3: "Especially my mother's approach, thinking that I could be an educator and saying things like 'you can teach, organize, and do it yourself' influenced me a little. I also wanted it for myself, thanks to her."
The opinions of teacher candidates regarding "choosing a major different from the family's desire"under the "own decision"theme are as follows:

MS11: "I chose this department because, of course, my family wanted me to study theology."
MS12: "My mother always preferred law, thinking that I could study law by preparing for another year and maybe getting better grades. I wanted to choose my department from my first year, and it was the department I wanted."
Regarding the "family preference" theme, the teacher candidate's view on the "relatives" code is as follows:
MS8: "Especially not only my parents but also my uncle had a great influence. Their continuous words such as 'teaching is a very beautiful profession; you explain it so well; children listen to you; you will be comfortable' had a great effect."
According to Table 11, four themes influence the choice of profession of classroom teacher candidates: "liking the school environment", "goals for the profession", "university-student life", and "no other factors". Under the "liking the school environment" theme, there are codes such as "childhood period" and "experiencing the profession". Under the "goals for the profession" theme, there are codes such as "instilling love and respect for the profession" and "different education systems". Under the "university-student life" theme, there are codes such as "easy reading conditions", "desired profession", and "having the department in their own city".

Table 11. Other effective factors

Themes-codes		Participants
Theme	Liking the School Environment	MS1, MS2, MS6, MS12, MS20
Liking school environment Codes	Childhood period	MS12, MS20
	Experiencing the profession	MS1, MS2
Theme	Goals for the profession	MS3, MS7, MS13, MS15
	Organizing the negatives	MS3, MS15
Goals for the profession Codes	Instilling love and respect for the profession	MS7
	Different educational systems	MS13
Theme	University-student life	MS2, MS4, MS9, MS11, MS18
	Easy reading conditions	MS9, MS18
University-Student life Codes	Desired profession	MS2, MS4, MS9
	Having the department in their own city	MS11
Theme	No other factors.	MS5, MS8, MS10, MS14, MS16, MS17, MS19

The views of teacher candidates on the code "experiencing the profession" under the theme of "liking the school environment" are as follows:
MS1: "Paid teaching was really the turning point for me. I said to myself, "I am now sure that I should be a teacher, and I should be here."
MS2: "I started teaching a lot while studying engineering. When I realized this, I felt that I wanted to pursue this profession and that I was happy here. That's why I was able to leave engineering.
Under the theme of "goals for the profession," the views of teacher candidates on the code "organizing the negatives" are as follows:
MS3: "A person who has received an education, for example, but is doing things that they shouldn't be doing or contradicting themselves. Some rights and wrongs should be taught in education. I want to be one of those who can say those things and do them. I chose this profession to regulate the negatives myself.
MS15: "Maybe it could be to defend or support children."
Under the theme of "university-student life," the views on the code "desired profession" are as follows:
MS2: "Studying engineering didn't have a direct effect, but I realized that this wasn't the only profession I wanted to pursue and started thinking about it."
MS4: "At that time, we started our internships in the second year. I looked and realized that I couldn't do it; I didn't like the hospital environment. Then I talked to my family and said, I want to be a classroom teacher."
In keeping with the "no other factors" theme, the teacher candidates stated during the interview that there were no other factors besides the ones asked about.

According to Table 12, the themes of "classroom teacher," "choice dilemma," and "classroom teaching field" are present in the career preferences of classroom teacher candidates. The theme of classroom teacher includes the codes "transition from a different profession," "state-rural schools," and "state-private doesn't matter." The choice dilemma theme includes the codes "classroom teaching," "graduate studies," "desire to study in a

different department," and "different profession." The classroom teaching field theme includes the codes "post-graduate education" and "academician."

Tablo 12. Preferences related to working lives

Themes-codes		Participants
Theme	Classroom Teacher	MS3, MS4, MS5, MS6, MS8, MS10, MS11, MS12, MS13, MS14, MS15, MS16, MS17, MS19, MS20
Classroom teacher Codes	Transition from a different profession	MS3
	State-rural schools	MS6, MS8, MS12, MS13, MS14, MS16, MS17, MS19
	State-private doesn't matter	MS5, MS15
Theme	Choice Dilemma	MS1, MS2, MS7, MS9, MS18
	Classroom Teaching	MS1, MS2, MS7, MS9, MS18
Choice dilemma Codes	Graduate studies	MS1, MS2
	Desire to study a different major	MS2, MS7, MS9, MS18
	Different profession	MS7, MS9
Theme	Classroom Teaching Field	MS3, MS4, MS5, MS6, MS8
Classroom teaching field Codes	Post-graduate education	MS3, MS4, MS6, MS8
	Academician	MS4, MS5

Classroom teacher candidates expressed their views on the "state-rural schools" code the most under the theme of "classroom teacher." Their views on this code are as follows:

MS12: "I want to work in rural schools. Since I grew up in the village, I think I won't have a hard time there, and when I look around even today, there are still a lot of issues with educating girls in my village and the villages I know. Maybe I can change this where I go. I say that I came from among you and I am still among you, and I think I can change this, so rural schools will be my first choice."

MS6: "I really want to be a rural teacher because it is very gratifying for me to be able to reach out to and benefit children in the village. I want to work in this area."

The opinions of teacher candidates on the code "desire to study in a different department" are as follows under the theme of "choice dilemma":

MS18: "I want to study nursing in a different department. I want to study nursing while teaching."

MS2: "If I struggle too much, I can quit and study at a new university again."

The opinions on the code "post-graduate education" under the theme of "classroom teaching field" are as follows:

MS3: "I want to do a master's degree in elementary school teaching. I want to learn the profession perfectly before starting."

M

MS4: "In the beginning, I want to work for a few years and then do a master's degree in elementary school teaching for about 5 years."

It is observed that teacher candidates who did not think about or were hesitant about choosing the classroom teaching department express their opinion that their choices for their careers were shaped in their last year at their department. The opinions regarding this finding are as follows:

MS14: "Definitely classroom teaching. If they presented me with the department that is my dream right now, I wouldn't go."

MS17: "I realized many things, and frankly, I liked it and discovered that it was inside me."

Discussion and Conclusion

The reasons for prospective teachers choosing the teaching profession and their preferences regarding their professional lives are crucial in shaping their attitudes towards the profession, professional identities, and career choices. In this study, the reasons for choosing the teaching profession were examined in terms of various influencing factors, and their preferences for their working lives were identified. The reasons for prospective teachers choosing the teaching profession and their preferences for their working lives are influenced by various factors. In this study, the reasons for prospective teachers choosing the teaching profession were evaluated in terms of their love for the profession, working conditions, encountered teachers, ÖSYM-YÖS scores, love for children, passion for teaching and learning, service to others, general and specific abilities, family, and other factors. The reasons for choosing the profession were primarily evaluated in terms of the impact of loving the

profession. Two themes emerged when prospective classroom teachers were asked about the effects of loving the profession on their decision. It was seen that teacher candidates mostly expressed opinions in favor of the "effect of loving the profession" theme. There are studies in the literature that support the results of this research, when the effect of loving the field and profession is examined (Çakır and Akkaya, 2017; Eret Orhan and Ok, 2014; İncikabı et al., 2016; Mašková et al., 2022; Özçakmak and Köroğlu, 2015). Some prospective teachers expressed opinions in favor of the "effect of lowering the profession" theme. Atıcı (2013) also concluded that half of the prospective teachers in the study group did not like the profession. Therefore, different studies can be conducted in the future that are related to the reasons for choosing the teaching profession.

When prospective teachers were asked about the effect of working conditions on the profession, two themes emerged: "affected and unaffected conditions". As affected conditions, "holidays and working hours" were the most commonly expressed codes. Teacher candidates stated that their working hours and holidays were influential in their decision to choose the teaching profession. In the research conducted by Yurdakal (2019) and Azman (2012), it was stated that working hours played a role in choosing the teaching profession. According to TALIS 2018 data, the factor of "work hours and the work schedule allowing me to spend time on personal responsibilities" was expressed as "very important" by about half of the teachers (Ceylan et al., 2020).

When examining the views of teacher candidates regarding the economic returns of working conditions, some express the existence of an economic benefit, while others argue that economic factors do not affect their choice. Buldur and Bulsal (2015) found that economic factors did not have an impact on the preferences of teacher candidates, whereas Beşoluk and Horzum (2011) stated in their research on the desire to become a teacher that job security, good economic conditions, and working conditions enable individuals to pursue the teaching profession. According to Organization for Economic Cooperation and Development (OECD) data for 2017, the starting salaries of primary school teachers in Turkey are close to the OECD average, but as their professional seniority increases, they fall behind the OECD average. In Can's (2019) study, which identified factors that hinder the professional development of teachers, working conditions, economic issues, and the status of the profession were mentioned as obstacles. This study also indicates that teacher candidates consider the effects of working conditions when choosing the profession. Therefore, it is important to improve these working conditions for young people to pursue the teaching profession and for their professional development.

Two themes have been created regarding the influence of former teachers on the career choices of teacher candidates: "positive and negative examples." The positive examples emphasized the love and interest code among the former teachers. Teacher candidates stated that they were influenced by their teachers and their guidance. Çakır and Akkaya (2017) also found that the reason for choosing the teaching profession is due to guidance and influence, similar to this finding. In contrast, Deniz and Görgen's (2019) study found no influence from the presence of a teacher in the family or teacher role models. Teacher candidates under the negative example theme expressed encountering negative behaviors and communication problems with their teachers, but they stated that they would turn the negatives into positives if they became teachers. Şahin et al. (2019) conducted a study on teacher candidates who took an elective course called "love education" in the field of educational sciences at a state university and concluded that love is the most basic need and supports the child's development in educational environments. The study also found that teacher candidates were influenced by the behaviors their teachers showed them when choosing their profession. Therefore, arrangements can be made in teacher training programs to develop teacher candidates' affective aspects.

When examining the views of teacher candidates on the effects of the ÖSYM-YÖS score on their career choices, two themes emerged: "loving classroom teaching and preference." Some teacher candidates stated that their only choice and goal was teaching because it was their profession of choice. However, they mostly expressed their dilemmas about their choices in line with their preferences, stating that they made choices based on their scores. Yılmaz and Doğan (2015) and Buldur et al. (2021) studies also found the effect of placement scores on the career choices of teacher candidates. Karabacak and Uzun's (2014) study found a relationship between teacher candidates' sensitivity to the teaching profession and their ranking in choosing the profession. Mankki and Kyrö-Ämmälä (2021) identified pre-entry demotivators among teacher candidates, which include impasses as a professional program due to limited career opportunities and inadequate diversity. Can's (2017) study concluded that centralized exams affect a significant portion of society, direct education to rote learning, and sideline the functions of education programs. Therefore, based on the results of this study, a process-focused approach should be adopted instead of a results-focused approach, and vocational education should be strengthened to train teachers and improve their qualifications.

Teacher candidates express the impact of loving children on their career choices through themes such as "communication with children, education targeting children, and no effect of loving children." Children are considered one of the fundamental factors that contribute to their professional satisfaction. Previous studies in the field also support the findings of this study that the love for children is a significant reason for choosing the teaching profession (Karademir and Yılmaz, 2020; Kılıç, 2022; Koşar, 2018; Mašková et al., 2022). Kolucki and Lemish (2011) state that communication is one of the most critical rights of children. Communication with

children should be supported to acknowledge them as individuals, listen to their voices, ensure access to information, facilitate their expression of cultural identity, and promote their development. The study indicates that teacher candidates recognize the effectiveness of communication with children in their career choices. Strengthening communication with children through various pre-professional activities for teacher candidates can be beneficial for fostering this relationship.

Regarding the impact of the passion for teaching and learning, two themes have been identified: "desire to teach-learn and no effect". Teacher candidates express their willingness to teach when they discover they can teach and enjoy research and reading. Studies in the field support these results, indicating that the desire to work with children and educate others is among the most crucial factors in choosing a teaching career (Hennessy and Lynch, 2017; Low et al., 2017; Keck Frei et al., 2017; Mašková et al., 2022; Watt et al., 2012). Aydın and Tekneci (2013) found that working in the field had an impact on teacher candidates' attitudes toward the profession. In Çakmak and Kayabaşı's (2017) study, "loving to teach" was among the reasons for choosing the teaching profession. Aktürk (2012) found that those who love the teaching profession are more open to learning.

When examining the impact of serving others, three themes have been identified: "serving the community, serving the future, and no impact." Among teacher candidates, the most commonly expressed benefit to the community under the theme of serving the community is serving the country. The importance of basic education in raising future generations is emphasized in the theme of serving the future. In the literature, the motivations for choosing teaching as a profession among teacher candidates include supporting the welfare and development of society (Kılcan et al., 2014), social utility values (Topkaya and Uztosun, 2012), and making a social contribution and shaping the future (Richardson and Watt, 2006; Watt et al., 2012). According to Bozbayındır (2019), factors influencing the status of teaching as perceived by teacher candidates include the profession being chosen by qualified individuals and its service to people. According to TALIS 2018 data, the most important reason for choosing the teaching profession in Turkey is the ability to serve society (85.77%), whereas this percentage is 64.59%, 52.53%, and 37.69% in the OECD, "PISA Best Europe," and "PISA Best Asia" groups, respectively (Ceylan et al., 2020). Future studies on teacher candidates should examine the effects of different cultures and contexts.

The effects of the general and specific abilities of teacher candidates have been categorized into themes of "has an effect" and "no effect". Teacher candidates who expressed their views on the "has an effect" theme emphasized the influence of their communication, teaching, and problem-solving skills (Kahyaoğlu and Kırıktaş, 2017; Watt et al., 2012). The presence of teacher candidates' abilities and their awareness of their abilities have influenced their professional preferences.

When examining the influence of family in the career choices of teacher candidates, there are three themes: "supportive, personal decision, and family preference." Teacher candidates indicated that their families were supportive, and both parents influenced their career choices. In addition, some candidates made their decision entirely based on their family's preference or their own decision. In the literature, studies (Yurdakal, 2019; Koşar, 2018) show that the family factor influences the career choices of teacher candidates. Özcan and Eranıl (2018) investigated the relationship between the attitudes of high school seniors towards the teaching profession and the attitudes of their parents. While the students had a high level of positive attitude towards the teaching profession, there was no relationship between their attitudes and their parents' attitudes. Therefore, various activities can be organized to direct students toward the teaching profession and promote its recognition.

When asked about the factors that influenced their preferences, teacher candidates identified the themes of "presence of influence" and "absence of influence." Those who expressed the "presence of influence" theme emphasized the impact of their communication, teaching, and problem-solving skills the most (Kahyaoğlu and Kırıktaş, 2017; Watt et al., 2012). The possession of certain skills and awareness of those skills also affected their professional choices.

Regarding other factors that influenced their preferences, teacher candidates identified the themes of "liking the school environment," "goals for profession," "university-student life," and "no other factors." The majority of teacher candidates stated that there were no other factors influencing their choice of profession.

Through the examination of the reasons for prospective teachers choosing the teaching profession, it has been found that loving the profession is an important factor. They are influenced by the working conditions of the profession they will encounter in the future. The attitudes and behaviors of previous teachers they have encountered, as well as the love and interest they have received from them, influence their choices. The desire to work with children, the passion for teaching, and the desire to serve the community are also contributing factors. It has been concluded that families are generally supportive when choosing a profession, and they are primarily influenced by their parents. It has also been found that centralized exams have an impact on selecting a profession.

When it came to their career preferences, teacher candidates expressed the themes of "classroom teacher," "choice dilemma," and "classroom teaching field." They expressed a desire to become classroom teachers and work primarily in government and rural schools. According to the TALIS 2018 survey, 64.69% of teachers in Turkey consider teaching their first career choice, while the OECD average is 63.73%, PISA Best Europe is

57.68%, and PISA Best Asia is 81.03% (Ceylan et al., 2020). In a study by Beşoluk and Horzum (2011), 69% of teacher candidates stated that they wanted to become teachers; 17.4% considered teaching an option only if they were assigned to it; 2.2% wanted to become teachers but found it difficult; and 11.4% did not consider teaching a career choice. It was observed that some teacher candidates who did not consider or were hesitant to choose the classroom teaching department as their major ended up choosing it as their preferred career after reaching their final year. According to Kılıç (2022), when given the chance to choose a second profession, teacher candidates showed the highest preference for teaching again. However, some teacher candidates expressed a dilemma about their career choices, with some stating a desire to study a different major or pursue a different profession. The "choice dilemma" theme revealed that teacher candidates who studied a different major or worked in a different field had more dilemmas regarding their future careers. Some teacher candidates expressed a desire to pursue postgraduate education and become academics in the field of elementary education. The research demonstrates the preferences of prospective teachers for the teaching profession and their preferences regarding their working lives. Based on this, academic and professional counseling services can be provided to prospective teachers to help them progress more successfully in their fields.

The reasons for prospective teachers choosing the teaching profession and their preferences for their working lives are crucial in terms of their approach to the profession and various other factors. As seen in the results of this research, just like the influence of many factors on the reasons for choosing the profession and preferences for working lives, when the literature on the field is examined, it is observed that the reasons for choosing the profession and preferences for working lives can also be influenced by multiple factors. In studies examining their relationship with professional attitudes, Nalçacı and Sökmen (2016) found a positive correlation between the reasons for choosing the profession, while Şata et al. (2022) identified a correlational relationship between career choice and professional image. Kozak et al. (2020) found a relationship between pre-service teacher identity and career choice. According to the TIMSS (2015) data, based on the satisfaction index of teachers with their professions, mathematics teachers have higher proportions of students who are "satisfied or very satisfied" with their profession. Similar results have been obtained for science teachers as well (Yıldırım et al., 2016). It is important for teachers to willingly pursue their profession for the future of students and school environments. Looking at the conducted research, it is evident that the reasons for prospective teachers choosing the teaching profession and their preferences for their working lives are highly significant in terms of their attitudes towards the profession, professional identities, and career choices. This research examined the factors that affect the decision of prospective classroom teachers to choose teaching as a profession and their preferences regarding work-life balance. The reasons for choosing the teaching profession and preferences for work-life balance are crucial in shaping prospective teachers' attitudes towards the profession, professional identities, and career choices. The current study identifies the importance of willing teachers to perform their professions for future students and school environments, and the study also highlights various factors, including the effect of loving the profession, working conditions, former teachers, and ÖSYM-YÖS score on career choices. To sum up, this research emphasizes the need to improve working conditions for teachers and develop teacher training programs that focus on teacher candidates' affective aspects.

Conflicts of Interest

There are no conflicts of interest regarding the publication of this paper.

Ethical Approval

The ethical approval for the research was obtained from the Fırat University Social and Human Sciences Research Ethics Committee with meeting number 2022/09 and decision number 08 on May 6, 2022. The necessary permissions were also obtained from the Dean's Office of the Faculty of Education of the university where the research was conducted.

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The Pattern of Relationship between Virtuous Leadership and Organizational Reputation: A Comparative Analysis

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Abstract

The purpose of the study is to examine the relationship pattern between school administrators' virtuous leadership behaviors and organizational prestige of schools. In order to examine the relationship pattern between variables, relational survey model (predictive design) was preferred among quantitative research methods. The study group of the research consists of 489 teachers actively working in Maltepe, Kartal, Pendik and Tuzla districts in 2023. Personal information form, Virtuous Leadership Scale and Organizational Respectability Scale were used to collect the data. Pearson correlation and regression analyses were used to analyze the data. According to the findings of the study, according to teachers' perceptions, the level of virtuous leadership of school administrators is high and the level of respectability of schools is medium. There is a positive and moderately significant relationship between the virtuous leadership behaviors of school administrators and the organizational prestige of schools. It was determined that virtuous leadership has the ability to predict the organizational prestige of schools positively. This study has made theoretical contributions to the field by identifying the virtuous leadership of school administrators and the organizational prestige of schools and revealing the relationship pattern between these two variables. Considering the findings and results, inferences were made about the virtuous leadership behaviors of school administrators and the dignity of schools and suggestions were made for practitioners, decision makers and researchers.

Keywords: Virtuous leadership, Organization, Respectability, Administrator, School.

Introduction

In modern times and at the global level, it is seen that people's life satisfaction has decreased due to the problems faced by the world and the increase in the problems that need to be solved. Organizations also take their share from the global challenges and increasing problems. For this reason, it is possible to say that a number of unethical and unlawful practices manifest themselves in organizations. The unethical and unlawful practices that people encounter in individuals or organizations that they are in contact with break people's trust in these people and institutions (Yiğit & Ağalday, 2020). In education, this loss of trust occurs at the level of teachers, school administrators and schools. The increase in people's negative attitudes and behaviors towards teachers, administrators and schools, the decrease in trust in the teaching profession, and the discussions about the damage to the reputation of educational organizations make themselves felt more and more today. Increasing negative attitudes towards the professional prestige of education employees also change the perspective of the society. For this reason, the issue of what moral virtues teachers and administrators should possess and how to increase these virtues gain more importance. In today's world where trust in leaders has decreased, legal regulations, professional norms and codes of conduct, and supervision practices are not sufficient to prevent misbehavior of contemporary leaders (Bragues, 2008). In the business world, organizations seem to focus on competition for efficiency and rarely emphasize virtue in their struggle (Cameron & Winn, 2012). For this reason, researchers have turned their attention to examining the virtues of leaders. Considering the research and findings, virtuous leadership is seen as very important in management processes (Caldwell et al., 2015; Cameron, 2011; Cameron & Spreitzer, 2013). For this purpose, "What are leader virtues? How are virtues acquired? In which context are virtues most often expressed as behaviors? In which leader behaviors do virtues manifest themselves?" (Hackett & Wang, 2012).

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The answers to the questions about virtuous leadership are important for the quality of the educational process and practices. Virtuous leadership involves a constant quest, and leaders strive to be virtuous as long as they continue to breathe. For virtuous leaders, the purpose of life is the pursuit of personal excellence. Leaders who aspire to achieve this lofty goal are virtuous leaders. These are people who are prudent, courageous, self-controlled, just, prudent, know how to say no, generous and humble (Havard, 2007). According to Aristotle, virtue is classified as courage, temperance, justice, generosity, magnanimity, magnificence, magnanimity, humility, truthfulness, wit, friendliness, temperance, decency, anger control, prudence and wisdom (Hackett & Wang, 2012). Plato, on the other hand, categorizes virtuousness, prudence, justice, courage and self-control as the basis of all human qualities. Wang & Hackett (2015) categorized moral virtues as courage, temperance, justice, prudence, prudence, humanity and integrity. On the other hand, virtuous leaders always have dreams based on volunteerism that they transform into a vision and mission, which is more than just thinking big. Even if a leader abandons humility and exhibits high communication skills, even if he or she uses strategies and tactics to get people to do what he or she wants, the flaws in the leader's character, the hypocrisy and insincerity of his or her behavior do not mean that he or she is successful (Covey, 2003). For this reason, virtuous leaders prefer to lead without resorting to manipulation and power. Their biggest goal is to elevate their vision to higher levels, raise their performance to high standards and build their personalities beyond normal limits. Like managers, they try to do the job right, while like leaders, they try to do the right job (Drucker, 2005). However, the right jobs sometimes bring negativities and risks.

While virtue contributes strongly to professional and personal life, it does not guarantee success. At the end of virtuous behavior, the leader may even be in danger of being ostracized or even facing death. Nevertheless, the virtuous leader who encounters failure, although sometimes driven to despair, endeavors to stay on the path and continue the search (Havard, 2007). Indeed, self-cultivation means that despite some difficulties, people continuously put into practice what they have learned until they make virtue a habit (Bragues, 2006). The virtuous leader must engage in ethical actions for consistent and intrinsic reasons as part of the goal of becoming a virtuous person by continuously practicing moral virtues (Whetstone, 2001). In this way, virtuous leaders should be seen as officials who know how to create value and build strong systems by building high trust and transforming the relational capital of the organization for the benefit of the organization (Caldwell et al., 2002). Nevertheless, there is an increase in unethical behaviors of leaders in management processes today. For this reason, it is important for leaders to exhibit transformative leadership in which higher values and organizational commitment are strengthened (Caldwell et al., 2015). Many researchers and academicians have made findings in their research on the role of leaders in strengthening values and commitment in organizations. Virtuous leadership is defined as virtue-based leadership or character-based leadership (Crossan, Mazutis, & Seijts, 2013; Wang & Hackett, 2020) and there are studies that reveal the importance of the virtue aspect of leadership (Thun & Kelloway, 2011; Wang & Hackett, 2015; Wang & 2020). Considering the studies on the virtuous aspect of leadership, leadership approaches such as moral leadership (Walker et al., 2007), ethical leadership (Brown & Trevin, 2006), servant leadership (Sarayrah, 2004), spiritual leadership (Cavanagh & Bandsuch, 2002), which are thought to be related to virtuous leadership, include virtue, morality and ethics components. Considering these studies, it is understood that there is a need for studies that reveal the importance of leadership with moral virtue for organizations. This study, on the other hand, makes theoretical and practical inferences about the role of virtuous leadership in increasing organizational reputation.

The purpose of this study is to reveal the impact of school administrators' virtuous leadership behaviors on the prestige of educational organizations. In line with this purpose, the first thing that is done is to develop suggestions about the importance of virtuous leadership and the value it adds to its followers, as well as propositions that will help researchers, policy makers and decision makers to measure the practical value of virtuous leadership. On the other hand, this research will provide a theoretical contribution to the gap in the literature on the role of virtuous leadership in increasing organizational prestige. The findings obtained through the survey method will be analyzed and the results will be presented in a comparative manner with the findings of different studies. As explained above, it is stated that the virtuous leadership behaviors of managers will be effective in enabling employees to build a virtue-centered moral identity (Wang & Hackett, 2020). By developing and/or nurturing moral character, a leader can bring about a change in the self-perception of both himself and his followers (Lord & Brown, 2004). The display of moral virtues by the leader is the basis for the mobilization of the moral virtues of the followers. The display of moral virtues has a transformative role that increases efficiency, productivity, quality and excellence while building commitment and trust (Caldwell et al., 2012). Virtuous leadership can create a trusting organizational culture with a high level of respect and trust through high level relationships (Cameron, 2003). This situation contributes to the increase in trust in human capital, which is the most important capital of the organization, and contributes to the productivity, quality and ultimately the reputation of the organization. In this direction, the following questions are sought to be answered:

1. To what extent do school administrators have virtuous leadership behaviors?
2. To what extent is there a relationship between the virtuous leadership behaviors of school administrators and the organizational prestige of schools?
3. To what extent does virtuous leadership predict organizational prestige?

Method

Research Model

Relational survey design, which is one of the quantitative research methods, was used to reveal the relationship between the virtuous leadership behaviors of administrators and the professional reputation of schools. Quantitative research is used to test theories by examining the relationship between variables or in the context of cause and effect. Quantitative research uses countable and measurable data to explain the group to which individuals belong. The hypothesis of the researcher is tested with the collected data. In this research, the virtuous leadership characteristics of school administrators and the characteristics of the prestige of schools were revealed by obtaining numerical data. On the other hand survey research, is the application of researchers to a sample group that will represent the universe in order to collect information about attitudes, opinions and behaviors (Creswell, 2017). For this, measurement tools were applied to a sufficient number of participants and care was taken to ensure that the sample represents the universe.

Research Group

The study group of this research consists of 489 teachers actively working in Maltepe, Kartal, Pendik and Tuzla districts in 2023. Stratified sampling method was preferred in the selection of districts. Families residing in the selected districts are considered to have "low-middle-high" socio-economic levels. For this reason, care was taken to select schools at an equal level from each district. The sampling type used to form the research group is simple random sampling. The selection is determined by giving each of the units in the sampling population list an equal chance of being selected. Considering that approximately 350 people are sufficient for correlational studies (Creswell, 2017), it is seen that the number of participants is sufficient. The participants' filling out the scale and answering the questions were based on complete voluntariness.

The distribution of the participants according to their demographic characteristics shows that 289 (59,1%) of the 489 participants were female and 200 (40,9%) were male; 34 (7%) were 25 years old or younger, 262 (53.6%) were 26-35 years old, 146 (29.9%) were 36-45 years old, 40 (8.2%) were 46-55 years old, and 7 (1.4%) were over 56 years old; 4 (0.8%) had higher education, 418 (85.5%) had bachelor's degree, 66 (13.5%) had bachelor's degree, and 1 (0.1%) had doctoral degree. 1) had a doctorate degree; 21 (4.3%) worked in kindergarten, 185 (37.8%) in primary school, 243 (49.7%) in secondary school, and 40 (8.2%) in high school.

Data Collection Tools

In addition to the personal information form created by the researcher, the Virtuous Leadership Scale and Organizational Respectability Scale were used to collect the data obtained from this study.

Personal information form: This form includes the variables of gender, age, graduation status and school type of the researchers.

Virtuous leadership scale: The scale, which was developed by Wang (2011) and consists of five dimensions (courage, humanity, justice, prudence, moderation), was adapted into Turkish by Yıldırım & Kahveci (2019). The scale consists of 18 items. The highest score that can be obtained from the scale is 90 and a high score indicates that administrators have high virtuous leadership characteristics according to teacher perceptions. The Cronbach Alpha reliability coefficient of the scale was determined as .94 in this study. Considering this level, the scale is suitable for use in the study.

Organizational Respectability Scale: The scale was developed by Hatipoğlu (2022). The scale consists of one dimension and 12 items. The maximum score of the scale is 60 points. A high score indicates that the prestige of organizations is high according to participant perceptions. The Cronbach Alpha reliability coefficient of the scale was calculated as .76 in this study. Considering this level, the scale is suitable for use in the research.

Data Analysis

In this study, correlation analyses were conducted to determine the relationship pattern between school administrators' virtuous leadership behaviors and the level of respectability of organizations. Before proceeding to the analyses that determine the relationship between the variables, it was examined whether the data were normally distributed. The suitability of normal distribution was reviewed by taking the -1.5 and + 1.5 intervals determined by Tabachnick & Fidel (2007) as reference. Skewness and kurtosis values for both variables are shown in Table 1.

Table 1. Normality values for virtuous leadership and organizational reputation

		Statistic	Std. Error
Virtuous leadership	Mean	4.03	.028
	Std. Deviation	.626	
	Skewness	-.394	.110
	Kurtosis	-.453	.220
Organizational prestige	Mean	3.20	.024
	Std. Deviation	.530	
	Skewness	-.285	.110
	Kurtosis	-.298	.220

Table 1 shows that the kurtosis and skewness values of the two variables were between -1.5 and +1.5, indicating a normal distribution. After the normal distribution was determined and verified, the data on the reliability coefficients of the measurement tools used in the study are shown in Table 2.

Table 2. Reliability coefficients for virtuous leadership and organizational prestige variables

Scales	Cronbach-Alpha	N or Items
Virtuous leadership	α= .937	18
Organizational prestige	α= .754	12

Table 2 shows that the reliability coefficients of the scales used in the study are .754 and .937. According to Özdamar (2017), it can be said that these values are sufficient for the scales to be used safely. After confirming the normal distribution of the data and the reliability of the scales, correlation analyses were conducted to determine the relationship between the variables.

Findings

According to teachers' perceptions, the levels of principals' virtuous leadership and schools' organizational prestige are shown in Table 3.

Table 3. Mean and standard deviation values of virtuous leadership and organizational prestige variables

Variables	N	M	SD	Assessment
Virtuous leadership	489	4.04	.626	High
Organizational prestige	489	3.20	.530	Medium

Table 3 shows that, according to teachers' perceptions, administrators have a high level of virtuous leadership (*M=4.03; SD=.626*) and schools have a moderate level of organizational prestige (*M=3.20; SD=.530*). Pearson correlation analyses showing the relationship between the variables are shown in Table 4.

Table 4. Pearson correlation analysis results on virtuous leadership and organizational reputation

Variables	Mean	SD	1	2
1- Virtuous leadership	4.04	.626	1	
2- Organizational prestige	3.20	.530	.414**	1

***p<.01; N=489*

Table 4 shows that there is a positive and moderately significant relationship between virtuous leadership and organizational prestige (*r= .414; p< .01*). In other words, an increase in the virtuous leadership behaviors of school administrators positively affects the prestige of schools. The effect level of virtuous leadership on organizational prestige was examined and the direct effect value is shown in Figure 1.

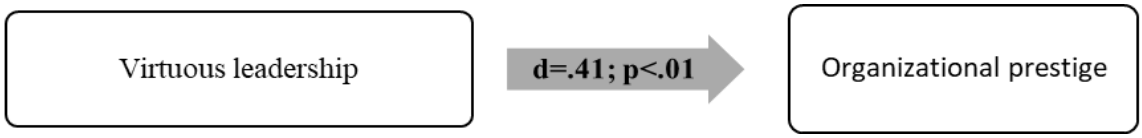

Figure 1. Direct impact of virtuous leadership on organizational reputation

Figure 1 shows that virtuous leadership has a direct effect on organizational reputation (d=.22; p<.01). However, regression analysis was conducted to determine whether virtuous leadership predicts organizational reputation.

Table 5. Regression analysis on the effect of virtuous leadership on organizational reputation

Model	Non-standard coefficient		Standard coefficient	t	p
	B	Standard Error	β		
Virtuous leadership	1,784	.143		12,489	,000
	.350	.035	.414	10,023	,000

N = 489, R = .414, R^2 = .171, Adjusted R^2 = .169

Table 5 shows that virtuous leadership has a positive predictive feature on organizational reputation (*R2 = .171*). In other words, the virtuous leadership variable explains 17.1% of the total variance of the organizational dignity variable. A one point increase in teachers' perceptions of virtuous leadership leads to a .171 point increase in their perceptions of organizational respectability.

Discussion and Conclusion

Considering the perceptions of teachers regarding the levels of virtuous leadership and organizational prestige, it was found that school administrators showed a high level of virtuousness. In addition, the level of respectability of educational organizations is at a medium level according to teacher perceptions. The high level of virtuous leadership characteristics of administrators shows that they are advantageous for organizations to be successful and achieve their goals. According to Senge (2006), leadership has a critical role in the success of organizations and the successful implementation of their strategies. Senge (2006) states that exemplary leader behaviors are effective in increasing the commitment of employees to the organization and in the formation of a supportive organizational culture in the organization. With the commitment of employees to the leader and the vision created by the leader, the organization can survive for a long time.

In the study, it is seen that there is a significant positive relationship between virtuous leadership and organizational prestige. In other words, when the level of virtuous leadership of school administrators increases, the prestige of schools also increases. In the increase of organizational prestige, it is effective that virtuous leaders are significantly different from other leaders in continuity based on their sense of responsibility towards the organization and themselves. One of the most important differences of virtuous leaders is that they empower their followers and the people they work with. The leader considers people as a key to creating value in an environment based on knowledge, wisdom and information (Covey, 2004). On the other hand, the virtuous leader has the obligation not only to create value for their organization but also to leave a legacy of a good world for future generations (Friedman, 2009). In addition to creating value for the organization, the highly qualified virtuous leader tends to protect the future of the organization without harming it (Lennick & Kiel, 2007).

Leader virtue has a critical role in increasing the prestige level of organizations and building a strong culture based on continuous development. The virtue of leaders is proportional to their success in increasing the competitiveness of the organization, creating long-term wealth, contributing to the sustainable growth of the organization, and contributing to the well-being of society (Caldwell, et al., 2015). In order to increase the organization's prestige and acceptance by society, the leader can create wealth when they understand the basis of both internal and external integration and the problems they need to overcome (Schein, 2010). This shows that in order to build organizational prestige, it is important for the leader to have the ability to ensure interpersonal communication as well as technical skills.

The existence of continuous improvement movements is valuable for the dignity, competitiveness, growth, acceptance and respectability of organizations. Here, the leader seeks opportunities for continuous improvement and does not shy away from experimentation and risk-taking. Continuous improvement is absolutely necessary for organizations (Collins, 2001). For this, one of the most important virtues expected from leaders is courage (Bennis & Nanus, 2007, Caldwell, 2015; Chirstensen, 2011). For this reason, every organization desires to have courageous and virtuous leaders. The problems that the world faces on a global scale and the new problems that

need to be solved require courage to address them. Virtuous leaders' courageously addressing problems and successfully fulfilling their roles not only ensure their personal success but also the success of their organizations. In this context, school administrators are expected to increase their moral virtues and put these virtues into practice in their behaviors. Administrators should know that they will create a climate of trust within the organization thanks to the virtuous behaviors they exhibit. It should be calculated that it will be possible to maximize interpersonal communication inside and outside the organization. In this context, practitioners and decision makers have important duties in increasing the level of sensitivity of school administrators regarding virtuous behaviors. Virtuousness should be considered as an important variable in shaping administrator training, selection and appointment processes. Managers' virtuous behavior during the performance of their profession should be made measurable. Virtuousness should be encouraged and contrary behaviors should be taken under control. Virtuousness should be the subject of continuous research by policy makers and researchers in different aspects for organizational prestige, organizational efficiency and continuity. In this study, only the relationship between virtuous leadership and organizational prestige can be considered as a limitation. For this reason, the concept should also be addressed in the context of administrators, teachers and other educational employees.

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Conflicts of Interest

There is no conflict of interest in this study.

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Understanding a Group of Teachers Who Carry out a Duty in a Socioeconomically Disadvantageous Area in the Southeast of Turkey

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Abstract

We know that the socioeconomic structure of the areas around schools affects schools and their educational activities. Considering this fact, in the present study we sought to stress how the socioeconomic structure of the areas of schools where teachers carried out their duties affected the teachers. In the phenomenological study, we aimed to reveal the inequalities faced by the teachers who carried out a duty in a socioeconomically disadvantageous area in the southeast of Turkey. In order to collect data, we conducted face-to-face interviews with the teachers who experienced educational inequalities in their schools. We found that the teachers experienced both physical and educational inequalities, and these inequalities had individual and organizational effects. Due to these effects, the teachers had social and individual expectations. As a consequence, it is possible to state that the teachers had similar job definitions; however, they did not have similar opportunities in terms of the areas where they carried out a duty. We stress the necessity of actualizing fair applications that pay regard to the qualities of areas where teachers carry out a duty.

Keywords: Disadvantageous schools, Equality of opportunity, Inequality, Socioeconomics, Teacher.

Introduction

Please Today, income inequalities between qualified and unqualified labor in both developed and developing countries have rapidly increased, especially since the second half of the 20th century (Bound & Johnson, 1992; Acemoglu & Pischke, 2001). The increasing income inequality has triggered educational inequality and increased with it (Gregorio & Lee, 2002), which has profoundly affected people who live in socioeconomically disadvantageous areas. These developments have increased the importance and number of studies on the education of children who live in lower socioeconomic conditions. Researchers have placed a greater emphasis on inequalities faced by students due to socioeconomic reasons (Acemoglu & Pischke, 2001; Engin-Demir, 2009; Miller et al., 2019; Sedibe, 2012; Silva-Laya et al., 2020). On the other hand, it is known that these structural problems also affect teachers who carry out their duties in disadvantageous areas with a lower socioeconomic level. It is because, although teachers have similar job definitions, they do not have similar duties and situations. The qualities of schools affect teachers (Dawson & Shand, 2019). Despite these effects, the literature has a limited number of studies examining the situations arising from the socioeconomic characteristics of schools and how these situations affect teachers. Examining available research, the researchers usually focus on lower academic performance, difficulties of classroom management, and supports received in disadvantageous areas (Dawson & Shand, 2019; Pàmies Rovira et al., 2016; Steins, 2016). Researchers are not so interested in the inequalities faced by teachers who carry out their duties in disadvantageous areas. Unlike the abovementioned research, we intended to stress what kind of inequalities the teachers who carried out a duty in disadvantageous areas faced due to the socioeconomic characteristics of the area. We consider the present study a key element in covering this gap in the literature.

The socioeconomic context affects not only students but also schools. Schools in socioeconomically disadvantageous areas face certain financial, organizational, and cultural inequalities in terms of the personal and social development of students (Silva-Laya et al., 2020). These inequalities affect not only students but also the school culture, which includes teachers, classes, and the school itself (Gehrke, 2005). It is because the socioeconomic structure of schools is one of the factors affecting teachers (Kelly, 2004). Carrying out a duty in

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schools in disadvantageous areas means lower academic standards, poverty, and systemic inequalities (Dawson & Shand, 2019). In disadvantageous areas, most factors like socioeconomic level of families, social circle, and opportunities and possibilities in schools (such as classroom size, access to technology, environment, academic achievement of students, and teachers' years of employment in schools) affect not only the success of students but also the way the teachers carry out their duty. Teachers in schools in disadvantageous areas with a lower socioeconomic structure may face different problems compared to their colleagues from upper and middle socioeconomic environments. For example, teachers in such schools have to cope more with peer victimization among students (Ozkan & Ciftci, 2010). As a matter of fact, since teachers in these areas have to struggle with problems arising from the disadvantageous area and school and are not satisfied with present conditions (Ozdemir et al., 2015), they usually demand reassignment. Therefore, there is a faster circulation of teachers in these areas. Among the reasons why teachers are assigned to other schools are different conditions in other schools (Demirel Yazici & Cemaloglu, 2022), the school environment, success status, social opportunities, and the desire to carry out a duty in better schools. Encouragement applications are also necessary for teachers who carry out duties in these areas to have a longer period of duty (Dolu, 2020).

The concept of equality is defined as a legal norm that enables every individual in society to access the resources and opportunities of society in line with their needs (Uzunaslan & Tek, 2019), whereas the concept of inequality can be defined as the absence of the aforementioned norm. The system of education in Turkey has a less egalitarian structure (Cingöz & Gür, 2020). This structure affects the school's organization as an open system (Kazu, 2019). From this point of view, in the present study we discussed "inequality", a deep subject that is difficult to understand at first. In the study, we focused on a real-life situation like educational inequalities faced by teachers in an area with a lower socioeconomic level. In the phenomenological study, we aimed to reveal the inequalities faced by the teachers who carried out a duty in a socioeconomically disadvantageous area in the southeast of Turkey. In line with this purpose, we shaped the subproblems of the study as follows:

- What are the most common inequalities faced by teachers who carry out their duties in a socioeconomically disadvantageous area?
- How do the inequalities faced by teachers affect their professional lives and educational activities?
- What are the expectations of the teachers for the reduction of the inequalities they face?

Method

In the current study, we particularly chose a qualitative method because it was more appropriate for discussing deep, sensitive, and structural issues (Creswell & Báez, 2020).

Study Design

In the design of the present study, we used phenomenology, which is a qualitative research design. Studies conducted with this design focus on how individuals make sense of phenomena they experience and try to understand them (Patton, 2014). Researchers aim to reduce the personal experiences of participants related to the phenomenon to universal statements (Creswell, 2016). In the current study, we used the aforementioned design because we aimed to reveal the viewpoint of the teachers who experienced inequalities concerning the phenomenon of inequality and the meaning they attributed to the phenomenon in question.

Data Collection Tool

In research conducted with a phenomenological design, researchers collect data from individuals who have experienced the relevant phenomenon. Researchers usually try to collect data deeply by conducting interviews and observations (Merriam, 2018). We collected the data for the current study by conducting face-to-face interviews with the teachers who experienced educational inequalities. We know that interviews are the major source of data for qualitative research. Emotions, thoughts, and experiences are usually revealed in this way (Patton, 2014). When creating the data collection tool, we primarily specified the questions to be asked. We presented the form that we created to two academicians who were experts in the field of educational sciences and to a literature teacher. One of the academicians suggested that a new question be added (the second question on the interview form), while the other academician and the literature teacher mainly recommended specific linguistic changes so that the questions might be understandable. In line with these recommendations, we updated the interview form. The first section of the form had questions about personal information related to the participants, such as age, professional seniority, and educational background, whereas the second section had seven basic questions.

Data Collection Process

Prior to the data collection process, we applied for ethics committee approval. We received ethics approval from the Harran University Social and Human Sciences Ethics Committee (dated 23.6.2022 and numbered 2022/99). Then we specified the school area to collect data. As we explained in the introduction, the knowledge and experiences of A.C., one of the authors in the present study, related to the area facilitated our work during the data collection process. For example, with the help of this experience, we chose schools in the area that were not much within sight and whose facilities we anticipated to be inadequate. Prior to conducting the interviews, we visited the schools and gave them information about the study. All the school administrators we interviewed agreed to give support to the study. Following the approval of the school administrators, we conducted preinterviews with the teachers who were to take part in the study. We informed them about the study and the questions that we planned to ask. Then we made appointments. We went to the schools on the days and hours of appointments. The participants signed voluntary participation forms, and we conducted the interviews. At the end of the interviews, we stressed that the present study, which aimed to attract the attention of implementers and policymakers, would reveal the inequalities faced by the teachers who carried out a duty in the aforementioned socioeconomic area, and in this sense, it would hopefully be useful for them. In order to inform those who were curious about the results of the study, we noted the e-mail addresses. Finally, we thanked them and left the school.

Working Group

The teachers in the working group carried out a duty in Garden (code name) province, which is located in the southeast of Turkey close to the border and can be accepted as being socioeconomically disadvantageous. Table 1 demonstrates specific data that supports our opinion that Garden is a disadvantageous area in terms of socioeconomic characteristics (Turkish Statistical Institute, 2022).

Table 1. Socioeconomic data related to Garden province

Population	2.143.020
Number of nonliterate	114.505
Unemployment rate	15%
Employment participation rate	40.6%
Mean household size	5.12
Immigration rate	-12.84
Income per capita	3075 Dollars

Considering the data in Table 1, it is possible to state that Garden is socioeconomically disadvantageous. However, in order to collect richer data, we chose to focus on a narrower area, which was more appropriate for the focal point of the present study. At this point, we took into account the data from research entitled Socioeconomic Development Order of Districts, which was published by the Department of Trade and Industry in 2022 (Socioeconomic Development Ranking of Districts, 2022). According to the abovementioned research, a large part of the districts in Garden are socioeconomically at the last two levels. However, Rose (code name) District attracted our attention in terms of accessibility. The abovementioned research suggests that Rose is ranked in the fifth area in terms of socioeconomic development and is ranked approximately 700th out of 973 districts. Therefore, we aimed to reach the teachers who carried out their duties in schools in these districts. At this point, as a prerequisite, we chose the teachers from different provinces or areas. It was because we anticipated that the teachers who were unfamiliar with the qualities and possibilities of the area would particularly feel the phenomenon of inequality more deeply. Therefore, we created the participants in the present study via purposeful sampling. Purposeful sampling enables researchers to choose situations that contain rich information at the point of depth of a study and to reach more information within the frame of the qualities of the specific group chosen (Patton, 2014). With this method, we conducted interviews with 18 teachers in five different schools. In line with ethical principles, we gave each participant a nickname. Table 2 demonstrates the demographic characteristics of the teachers in the working group.

Table 2. Personal characteristics of the participants

Nickname	Gender	Age	Years of Employment in School (year)	Educational Background	Professional Seniority (year)	School Grade
Kerem	Male	38	8	Bachelor's degree	14	Elementary
Mert	Male	28	3	Bachelor's degree	3	Secondary
Duru	Female	33	6	Bachelor's degree	10	Elementary
Yaren	Female	31	8	Bachelor's degree	8	Elementary
Burak	Male	27	4	Bachelor's degree	4	High school
Doruk	Male	31	1	Bachelor's degree	1	High school
Ece	Female	28	2	Bachelor's degree	2	High school
Azra	Female	26	2	Bachelor's degree	2	Elementary
Yağmur	Female	38	12	Bachelor's degree	6	Secondary
İpek	Female	33	7	Bachelor's degree	3	Secondary
Alp	Male	28	5	Postgraduate	5	Elementary
Işık	Female	27	3	Bachelor's degree	3	Secondary
Pelin	Female	29	6	Bachelor's degree	6	Secondary
Başak	Female	30	2	Bachelor's degree	7	Secondary
Pınar	Female	29	6	Bachelor's degree	6	Elementary
Cem	Male	35	8	Bachelor's degree	8	High school
Emre	Male	30	5	Bachelor's degree	5	High school
Tuna	Male	25	1	Bachelor's degree	1	High school

When determining the participants, we paid attention to choosing both female and male participants and teachers who carried out a duty in elementary schools, secondary schools, and high schools. We aimed for maximum diversity. As Table 2 demonstrates, the participants were aged 25 to 38 years. Their professional seniority ranged from one year to 14 years, and their years of employment in school ranged from one year to twelve years. As the table demonstrates, in terms of educational background, all of them had a bachelor's degree, whereas one was a postgraduate. The shortest duration of the interview was 25 minutes, and the longest was 36 minutes. We conducted the interviews in quiet places where the teachers would feel comfortable. We typed out all the interviews.

Analysis of the Data

We primarily read the data acquired in general. After having an opinion about the data, we started the analysis. While doing this, we used the content analysis technique. Content analysis degrades large-scale qualitative data sets into codes and themes and then interprets them (Patton, 2014). Accordingly, we examined the interview forms and specified codes. We created a code chart. We clustered the codes written on the chart under themes, which created a meaningful whole. In addition, we tried to place emphasis on citations and context in line with the nature of qualitative research.

Validity and Reliability Studies

In qualitative research, there is consensus on following ethical principles from the beginning of the research until the end in order to increase validity and reliability (Merriam, 2018). In this context, we paid attention to ethical principles at all stages of the present study. In order to increase the validity and reliability of the study, we used some of the strategies recommended by Creswell (2017) and Patton (2014) for qualitative research. The first of these strategies was triangulation. As is known, the triangulation approach plays a role in strengthening the research and enables researchers to test the consistency of the data acquired (Patton, 2014). In the current study, we tried to increase the validity with the participation of more than one researcher using the triangulation types. As the two authors in the study, we analyzed and compared the data individually. Of the twelve codes created, ten were synonymous, the same, or similar. We debated over the two and arrived at a consensus. Miles and Huberman (1994) find at least 80% conformity between coders to be adequate for reliability. Accordingly, it is possible to say that this requirement was also met. Another strategy was member control. Following the initial analyses, we interviewed three participants (Yaren, Yağmur, and Tuna) once again. These participants examined the analyses and did not object at all. They stated that the codes and themes reflected their opinions. Finally, we used the direct citation strategy, which might best reflect the themes.

Limitations

The area where we collected the study data was mainly an area of people who can be considered urban poor. Socioeconomic characteristics in rural areas and inequalities faced by teachers may vary. In addition, since the cultures of different areas may vary, the inequalities faced by teachers may vary as well. Finally, the data in the present study consisted of the views of the teachers who came to the area from another region. Inequalities faced by teachers who are born and raised in the same area may also vary. Due to all these reasons, the present study makes no claim to generalization.

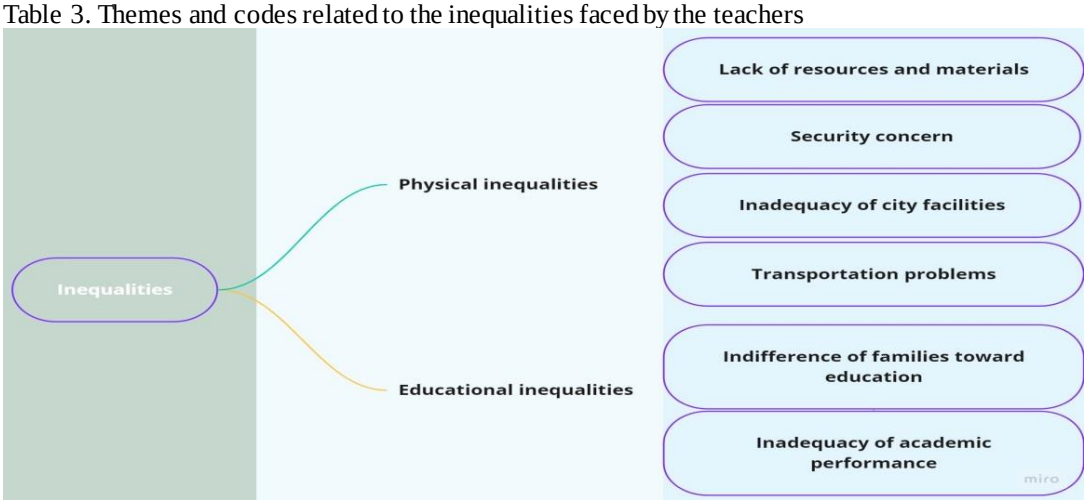
The role of the researchers

The current study in which I took part as one of the researchers (A.C.) was inspired by a school in a socioeconomically disadvantageous area where I had carried out a duty for nearly six years. During this time, I often heard complaints, especially from teachers who were unfamiliar with the area. These complaints were mainly about the socioeconomic characteristics of the school area. My colleagues, who came to school cheerfully like little kids when they were first appointed to their duty, would begin to dislike the school over the years. Then they would leave the school at the earliest opportunity to work in places with better possibilities. I know that things are still the same. This desire to understand the teachers and hear their voices has impelled me and my researcher colleague to plant the seeds of the present study. The seeds have grown and given us the study as a fruit. We expect that the study will pave the way for understanding the educational inequalities faced by teachers who carry out their duties in socioeconomically disadvantageous areas. In addition, we would like to stress the other side of the medallion by evaluating the concept of inequality, which is commonly used by students, from the viewpoint of teachers.

Results and Discussion

We expressed the data acquired from the interviews conducted with the teachers primarily with codes and then with themes in a way to create a meaningful whole. First, we tried to reveal the inequalities faced by the teachers who carried out their duties in socioeconomically disadvantageous schools. Based on the views of the teachers who expressed the inequalities they faced, we created the codes and themes in Table 3.

Table 3. Themes and codes related to the inequalities faced by the teachers



We clustered the inequalities faced by the teachers who carried out their duties in socioeconomically disadvantageous schools as physical and educational inequalities. Within the scope of physical inequalities, lack of resources and materials came to the forefront as an inequality faced by the teachers who took part in the current study. Since eight teachers out of 18 carried out a duty in schools in a socioeconomically disadvantageous area, they stated that they were either ignored or pushed into the background by the Directorates of National Education in terms of the allocation of resources and materials. Concerning this matter, two of the teachers stated, "*In socioeconomically advantageous areas, classes are supported by a variety of resources. However, this is not possible in this area. Sports equipment is inadequate... (Teacher Yaren)*". Actually, we know that the basic needs of schools in Turkey are met by the Ministry of National Education. In addition, other shareholders may provide public and financial support. This support may vary according to the environment of the school. In other words, the views of the teachers who took part in the present study on this matter might be associated with the social and economic structure of the school environment.

A portion of the participants stated that they did not feel fully safe around school or in the city. The female teachers particularly stated that they could not go out at night and were attentive to wearing clothes that would

not attract much attention. Concerning this matter, Teacher Ece stated, "*When I am home, I try not to go out alone at night. I feel uncomfortable with the glances of people around school. People find the way I get dressed, dye my hair, and drive to be odd."* Most female teachers mentioned this situation. Therefore, it is possible to say that the cultural characteristics of school environments may also affect teachers.

Another inequality faced by the teachers was the inadequacy of city facilities. One-third of the participants stated that the social infrastructure and social activities in the area where they carried out a duty were too weak. For example, Teacher Alp expressed his thoughts as follows: "*I would like to spend the best years of my life in a place that has greater social opportunities and where people are more open to communication. We look forward to the holidays. Probably more than the students."* As can be seen, the socioeconomic characteristics and social life in the city did not satisfy these teachers. It is known that a great number of teachers are assigned to the city during teacher assignments, which are made centrally every year in Turkey. We believe that teachers who are assigned need to be supported in social life.

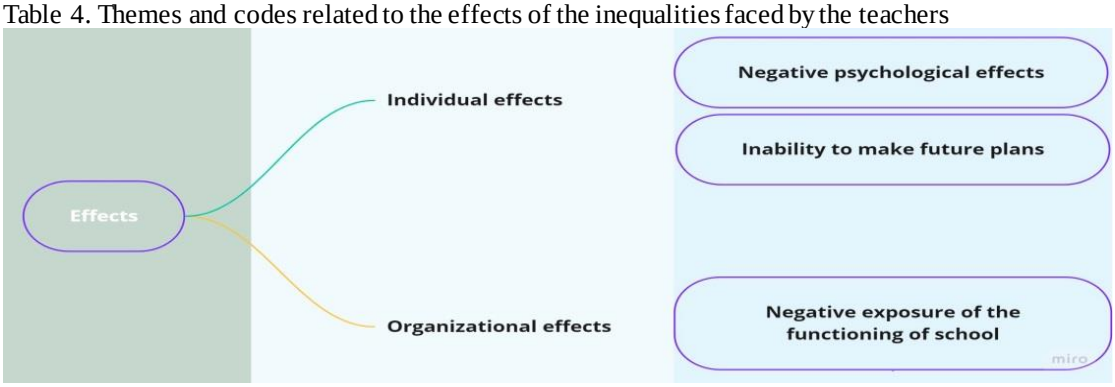
The last code created under the physical inequalities theme was transportation problems. The teachers stated that they had to dwell in another district due to the socioeconomic characteristics of their school, which had brought along time and cost problems related to transportation. Concerning this matter, one of the teachers stated, "*I cannot live in this area. I live in another district, and this brings along transportation problems. We cannot take the bus, because the fuel is too expensive to afford (Teacher Cem).”* Observing the school environment, we anticipate that the teachers do not dwell near the school due to the present social and cultural structure. Therefore, we understand that they face inequalities regarding transportation problems.

Half of the participants stated that their families did not care about school and education. The participants perceived the effects of this situation as inequality. For example, Teacher Başak stated, *“Families have a lower level of education in general. They do not take care of their kids. We cannot receive feedback regarding our activities. They are just so careless. This decreases our motivation They may want to take their kids home from school for a variety of reasons (such as visiting a relative, cleaning, etc.). As a consequence, they do not adequately support the development of their kids." We believe that this insensibility is related to the socioeconomic structure of families.* Educational background and economic structure of families may prevent them from considering education a priority.

Some of the participants stated that one of the inequalities they faced due to carrying out a duty in a socioeconomically disadvantageous area was the inadequacy of academic performance among students. Concerning this matter, Teacher Azra stated, "*Financial impossibilities affect the academic performance of kids very much. I think even the responses of kids to any incident or question are different in socioeconomically advantageous areas."* From this point of view, it is possible to talk about a correlation between socioeconomic structure and academic performance. In addition, we believe that the teachers’ perception of an inequality concerning this matter is worthy of discussion.

With the aforementioned themes and codes, we tried to answer the first question of the present study. After revealing the inequalities faced by the teachers, we tried to find out how these inequalities affected their professional lives and education. We created the themes and codes in Table 4 based on the common statements of the participants.

Table 4. Themes and codes related to the effects of the inequalities faced by the teachers



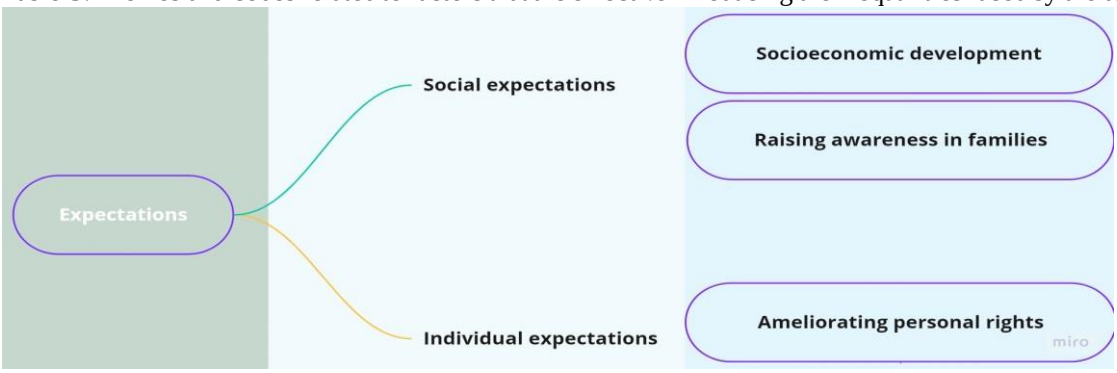
As Table 4 demonstrates, the inequalities faced by the teachers had individual and organizational effects. The majority of the teachers indicated that they had bad psychology due to the inequalities they faced. Concerning this matter, one of the teachers stated, "*Sometimes I question myself in a professional sense. The kids have problems, and we cannot solve them. I just feel upset, said Teacher Doruk."* Another teacher stated, "*It decreases our movement so much... We give up at some point... (Teacher Emre)."*. We actually find it normal for the inequalities faced by the participants to affect their psychology negatively. Indeed, we understand that the teachers feel upset, less motivated, and experience negative emotions like stress and burnout due to the inequalities they face. Also, we know that it is not easy to get rid of these psychological moods.

A part of the participants indicated that the inequalities they faced affected their future plans, prevented them from making plans, and caused a sense of uncertainty and restriction. Among these participants, Teacher Pelin stated, "*I have to spend the best years of my life here. I don't know how much energy I will have when I return to my home town. I cannot make plans for the future. We feel restricted and trapped.*" At this point, as we explained in the characteristics of the working group, we believe that it is noteworthy to remind you that the teachers who took part in the present study were strangers to the area where we conducted the study. We find it perfectly normal for the teachers to want to return to their home town and carry out their duties there.

Some of the teachers who took part in the study indicated that inequalities affected the functioning of the school negatively. They stressed that the lower socioeconomic characteristics of the school environment affected the school negatively. Concerning this matter, Teachers Burak stated, "The financial *situation of the students affects the functioning of the school. We cannot even join a simple social activity. Some students even come to school without eating and don't eat anything at school either. Sometimes I want to recommend a book, but I just forget about it because I know they cannot afford it.*" Socioeconomic characteristics of the school environment may affect school activities. However, we would like to stress that some teachers consider this situation an injustice and are negatively affected by it.

With the abovementioned themes and codes that we created concerning the impacts of the inequalities faced by the teachers, we gave an answer to the second question of the present study. Finally, we tried to reveal the factors that might be effective in reducing the inequalities experienced in education, according to the views of the teachers who took part in the study. Table 5 demonstrates the themes and codes created in line with the views of the participants.

Table 5. Themes and codes related to factors that are effective in reducing the inequalities faced by the teachers



As Table 5 demonstrates, nearly one-third of the teachers who took part in the current study stressed the necessity of the socioeconomic development of the area for solving the inequalities faced. The teachers indicated that they expected long-term and permanent policies from the government, municipalities, and universities. They believed that these policies would ameliorate the socioeconomic structure of the area. Concerning this matter, one of the teachers stated, "Rather than individual efforts, we need to struggle altogether. We need permanent solutions far from political thoughts. We need to believe that we can change things together. (Teacher Azra) Another teacher stated, "We need a whole mobilization with policymakers, trainers, families, and students (Teacher Emre). We believe that the teachers have quite realistic expectations regarding the socioeconomic development of the area. Indeed, considering the qualities of the area where we conducted the study, it is possible to consider the expectations of the teachers to be natural and necessary.

Of the 18 participants, seven stressed the necessity of raising awareness in families in order to solve the inequalities they faced. Concerning this matter, Teacher Yağmur stated, "There is a need for more educated people. There is a need for more literate people who will live here and change things here. For this, we need to train parents and raise awareness among people." This expectation of the teachers demonstrated that they were well aware of the importance of family in children's education. In addition, this expectation may indicate the desire of the teachers to carry out a duty in schools with more conscious parents.

Of the teachers who took part in the current study, nearly one-third indicated that based on the socioeconomic characteristics of the school environment where they carried out a duty, they expected specific ameliorations in their personal rights. Concerning this matter, Teacher Cem stated, "Teachers who carry out a duty in such schools can have specific positive discrimination. For example, teachers who have been carrying out a duty in such schools for more than a certain period of time can retire a few years earlier." Teacher Emre stated, "The personal rights and financial income of teachers should be ameliorated. These teachers should have positive discrimination." Actually, we know that school areas in Turkey are grouped according to specific qualities, and teachers are given service points according to the school area. However, considering the views of the teachers who took part in the present study, we see that there is no fair evaluation. In addition, we would like to stress

that the teachers expect more personal rights. In this way, we gave an answer to the third question of the study. We evaluated the findings that we explained individually until here in the discussion and conclusion section with a holistic sense in company with the relevant literature.

Results and Discussion

In the present study, which sought to reveal the inequalities faced by the teachers who carried out a duty in socioeconomically disadvantageous areas, we found that the teachers experienced physical and educational inequalities. The previous literature is in agreement with the fact that these schools face a variety of difficulties arising from a lack of physical infrastructure, resources, and materials that are necessary for educational activities, and this situation has a negative effect on equality in education (Anali & Sahin, 2020; Karatas & Cakan, 2018; Kozikoglu & Senemoglu, 2018; Tosun et al., 2020). In addition, we know that inadequacies related to cultural, financial, and social resources prevent academic activities in schools from being among the primary activities and being appreciated (Rivera Maulucci, 2010). Therefore, the possibility of facing lower academic performance may increase. Children who grow up in areas that face lower socioeconomic conditions like unemployment, poverty, and the need for social aid may display worse academic performance, which may bring along fewer educational acquisitions for students (Hall et al., 2022; Miller et al., 2019). It is because it is harder for these students to concentrate on school and academic activities. Considering that the socioeconomic structure of the school environment affects the academic life of students (Cochran-Smith, 2016; Sedibe, 2012), carrying out a duty in schools with lower academic performance may cause teachers to feel inadequate and dissatisfied (Kelly, 2004). Therefore, we understand that the teachers in the present study considered this situation an inequality.

The teachers who had difficulty coming to school dwelled in other places due to the social, cultural, and economic characteristics of the area where they worked, which made it difficult for them to come to school and caused economic loss. The teachers desired to carry out their duties in areas with better opportunities and a higher sociocultural structure. We understand this desire. On the other hand, as some teachers indicated, transportation problems may sometimes lead to safety concerns and problems (Karatas & Cakan, 2018). Studies on education usually handle the matter of safety in the context of students and ignore the safety of teachers. However, teachers may experience safety concerns at an individual, organizational, and social level both inside and outside the school (Berkowitz et al., 2022). When undesirable situations like aggression, trauma, and violence are experienced around school, it will become difficult for teachers to carry out their duties, and safety concerns will increase (Maring & Koblinsky, 2013). Female teachers may even feel these concerns more intensely. From this point of view, it is possible to state that the cultural characteristics of school environments may repress teachers. Female teachers may particularly feel neighborhood pressure due to the cultural characteristics of the area. This can be related to factors like lower educational levels, social and economic opportunities, and lifestyle.

Inadequate city facilities were another physical inequality faced by the teachers. Educational quality can be lower, especially in schools in shantytowns, ghettos, or other disadvantageous areas. Although these schools are in the city center, they are socially, culturally, and economically far from other areas of the city. Such an environment may trigger the desire of teachers to carry out a duty in different school areas (DeMatthews vd., 2022; Mitra et al., 2008; Kraft vd., 2015). In situations where a whole city has social, cultural, and economic deprivations, teachers may desire to carry out a duty in a different area. In that case, teachers may compare themselves to colleagues who carry out a duty in areas with socially, culturally, and economically better opportunities and consider this an inequality. We can accept the existence of such a phenomenon specific to Turkey. As we specified in the introduction section, it is possible to say that a similar situation will arise considering the qualities of the area where we collected the study data.

Another matter was that families did not care about school. In schools in socioeconomically disadvantageous areas, families not caring about and supporting schools adequately and not collaborating with schools pose a noteworthy pedagogical problem (Anali & Sahin, 2020; Tosun et al., 2020). In these schools, families have limited interest and participation in school, especially due to inadequate cultural and economic capital. Parents are usually unable to spend time with their kids due to longer working hours, and thus, they do not have the academic skills to support school activities. They have limited participation in parent's meetings and other school activities (Martínez, 2014; Sedibe, 2012). Indeed, inviting these parents to school may be intimidating for them (De Lange et al., 2012). However, the participation of families in school, especially in these areas, may make more positive contributions. Stronger parental networks may enable parents to actively take part in school and prevent disadvantageous situations (Li and Fischer, 2017).

Considering the abovementioned inequalities, it is crucial to increase the motivation of teachers, prevent them from experiencing burnout, and provide them with welfare (Miyajima, 2008). It is possible to say that teachers in schools in areas where poverty is experienced more intensely have difficulty being pedagogically effective. These teachers who are intimate with difficult student groups experience burnout more often and get estranged

from their productivity, which may affect their professional development negatively (Kelly, 2004; Sass et al., 2012). At this point, supporting teachers in terms of professional development may increase their commitment to their school and profession as well as their motivation (Kelly, 2004). Teachers with a higher level of self-efficacy perception and psychological resilience may be expected to carry out their duties more effectively in disadvantageous schools. When these teachers realize that they work under harsh conditions, their passion and motivation for their profession may increase (Dawson & Shand, 2019).

Situations faced by teachers in and around school may affect the functioning of the school. For example, Allen et al. (2018) found a positive, if not very great, correlation between the disadvantage level of the school area and the replacement rate of teachers. Similarly, DeMatthews et al. (2022) suggest that teacher turnover is higher in low-socioeconomic regions. This result indicates that teachers who carry out a duty in disadvantageous areas will have a higher possibility of quitting school. Moreover, the difficulties faced by teachers may have a negative effect on their ability to develop a sense of belonging at school. They may desire to go to areas where they can carry out their duty under better conditions (Karatas & Cakan, 2018). This may cause uncertainty and make it difficult for teachers to shape their future plans. On the other hand, as the qualities of the school environment affect the attitudes, thoughts, and behaviors of students, we need to stress that it is hard to manage the behaviors of students in school and in the classroom, apply the rules, and add social skills (Maring & Koblinsky, 2013). For example, it is possible to state that teachers who carry out a duty in disadvantageous areas have greater difficulty in classroom management (Steins, 2016). Such an environment may affect the functioning of the school negatively.

We revealed that the teachers who carried out a duty in socioeconomically disadvantageous areas had social and individual expectations, like the socioeconomic development of the area, raising awareness in families, and ameliorating personal rights. The extent of conditions among families who live in disadvantageous areas, such as unconsciousness, indifference, the absence of a place to study, domestic violence, and child labor, may affect the academic performance of children. At this point, it is crucial that awareness be raised in families (Ozcan et al., 2018). It is possible to say that families with better socioeconomic opportunities will be more conscious of their interest in education. Finally, considering the crucial role of ameliorating the occupational, social, and economic conditions of teachers in increasing the professional esteem of teaching (Sahin, 2018), ameliorating personal rights may make positive contributions, especially for teachers who carry out a duty in disadvantageous areas. For example, incentives that can compensate for the difficulties in teachers' working conditions can be useful in this regard (Kolbe & Strunk, 2012).

Conclusion

As a consequence, considering the findings obtained in the present study, it is possible to state that teachers who carry out their duties in socioeconomically disadvantageous areas experience a variety of inequalities in physical and educational fields. From this point of view, we conclude that teachers do not have similar opportunities and possibilities in the context of the areas where they carry out their duties. Accordingly, we believe that it is necessary to fairly actualize physical and educational applications that consider the qualities of the areas where teachers carry out their duties. We think that these applications will positively affect not only teachers, but also students and educational activities.

Recommendations

In light of the study findings, we can recommend that policymakers, schools, and municipalities extend programs aimed at the training of families in socioeconomically disadvantageous areas in particular. We suggest that schools in such areas be supported more often in terms of the resources and materials used in educational activities. Teachers who carry out a duty in disadvantageous areas can be encouraged to take part in activities like trips, concerts, sports competitions, and festivals. Off-price transportation support can be provided to these teachers by collaborating with municipalities. Strengthening the psychological resilience of teachers at all levels, from school administration to ministry, can have a positive effect. Ameliorations can be made, particularly in the personal rights of teachers who carry out a duty in disadvantageous areas. Finally, we certainly stress the need for strengthening the socioeconomic structure of families for a permanent solution.

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Authors Contribution Rate

Author (s) contribution rates: Ali Culha % 65, Hasan Demirtas % 35.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Ethical Approval

Ethical permission (23/06/2022-2022/99) was obtained from the Harran University Social and Human Sciences Ethics Committee for this research.

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Impact of Gamification Applications on Students' Attitudes towards Lesson and Procrastination Behaviors

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Impact of Gamification Applications on Students' Attitudes towards Lesson and Procrastination Behaviors

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Abstract

The aim of this study is to evaluate the effectiveness of foreign language teaching with gamification applications in primary school. In this research, embedded design, which is one of the mixed methods in which quantitative and qualitative methods are used together, has been adopted. The study group for this research is comprised of 33 students in 4th grade at a primary school. Research data were collected through an attitude scale for English lessons in primary school, homework, a follow-up chart, and a semi-structured interview. The data of the scale were subjected to inferential statistics; the data of the chart were subjected to descriptive statistics; and the data of the interview were subjected to content analysis. According to the findings of the study, the gamification applications significantly increase the attitude of primary school students and have a positive effect on procrastination behaviors. In addition, primary school students have positive evaluations of these applications as making the learning process fun, increasing their curiosity to learn, increasing their participation in the lesson, and increasing their desire to be successful. In line with these results of the research, it is recommended to use gamification applications in education for effective teaching.

Keywords: Gamification, Primary school students, Attitude, Procrastination behaviors, Motivation

Introduction

Childhood is an important period in which physical and mental development continue rapidly. One of the most basic requirements of this period is the game, which has a deep history (Koçyiğit et al., 2007). The game is defined as an ability and intelligence developer with certain rules and a tool for having a good time (Turkish Language Society, 2023). Järvinen (2008) explains the game as a system in which the player strives and concludes within the framework of certain rules. In this system, children have the opportunity to use all their senses and to repeat, reinforce, and develop the knowledge and skills they have learned from their environment. With these opportunities, games support the cognitive, emotional, physical, and social development of children (Lee & Hammer, 2011) and prepare them for life with real-life experiences (Ulu, 2019). Games, which are preferred due to the benefits stated in the education process, make learning more enjoyable and permanent by providing interesting and motivating environments for students from the beginning of their education life and increase academic success (Hanus & Fox, 2015; Işık & Semerci, 2016; Su & Cheng, 2015) by supporting the attitude and motivation towards the lesson positively (Uyar, 2019; Yıldırım, 2016). In addition, due to the nature of the game, the self-confidence of the students involved in the process and their active participation in the lesson are also supported (Bağcı, 2011).

Despite the fact that the foreign language teaching process is supported by different methods and techniques in Turkey, as in every country, education programs are updated (Agaoğlu, 2020), and language teaching is started in the second grade, the desired achievements in foreign language teaching have not been achieved (Eyüboğlu, 2022; Seferoğlu et al., 2008). This situation experienced in the language teaching process stems from many reasons, such as the easy distraction of students, their boredom (Kırkkılıç et al., 2005), and the lack of appropriate approaches, methods, and techniques (Akdoğan, 2010; Kubanç & Selvi, 2022).

Students need to exhibit and reinforce these behaviors outside the classroom in order to transform the achievements they have acquired in the learning environment into behavior. Out-of-school tasks such as homework and project assignments are among the most frequently used activities that put the student at the center of learning and ensure their active participation in the process. While students perform tasks that are

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enjoyable to them, they tend to postpone tasks that cause anxiety and require more effort. Procrastination is defined as postponing duties such as homework or projects or delaying responsibilities to do them at different times (Lay, 1986). The student's procrastination behavior may cause negative attitudes towards the lesson and decrease academic success (Akpur, 2017). The underlying causes of procrastination are often fear and anxiety, indecision, an unwillingness to perform the task, and a lack of motivation. At this point, it is important to give students out-of-school tasks that they will be interested in and enjoy. While students tend to do projects and activity-based tasks on time, especially in homework given at the primary school level, they do not like time-consuming classical types of homework such as reading and writing (Duru & Çöğmen, 2017). On the other hand, most teachers give homework once or twice a week (Can, 2019), but students tend to avoid doing homework that is given frequently (Soy, 2022). The homework given at the primary school level, where most of the students are introduced to a foreign language for the first time, should be structured, taking into account the expectations and needs of the students. As a matter of fact, effective foreign language teaching is provided with the help of students' high interest, attitude, attention, and motivation (Lee & Hammer, 2011).

Attitudes are beliefs or predispositions that a person develops based on her or his own knowledge and motives about herself or himself or another object in his or her environment (Güngörmüş, 2007). For effective foreign language teaching, greater efforts should be made to ensure that students have a positive attitude towards foreign languages. It is also known that gamification in the educational process has a direct positive effect on students' attitudes towards the lesson (Kunduracıoğlu, 2018; Yıldırım, 2017). Considering the developmental characteristics of the students, the inclusion of games in the teaching process at the primary school level creates a fun learning environment where students can express themselves comfortably (Ertan, 2020; Hanus & Fox, 2015; Özkan & Samur, 2017; Su & Cheng, 2015). Gamification is one of the applications that will enable students to learn a foreign language with different uses (Kırkkılıç et al., 2005), increase self-efficacy in language learning (Temel, 2022), and use the game as a tool in education (Akbaba, 2006; Koç-Avşar & İsabetli, 2017; Sarı & Altun, 2016). Gamification, which started to be used as a term in the 2000s but dates back to the 1980s (Özkan & Samur, 2017), has also been used in learning environments in recent years (Çağlar & Arkün-Kocadere, 2015; Park & Bae, 2014). Gamification in education is the use of game elements in the design of non-game content. Thus, the components of the game (score, leaderboard, rule, announcement notification, avatar, etc.) are intended to attract students' attention, increase their motivation, and encourage their learning and problem solving during the process (Deterding et al., 2011; Fiş-Erümit & Karakuş, 2015; Kapp, 2012; Lee & Hammer, 2011; Prensky, 2001; Zicherman & Cunningham, 2011). It can be used individually or as a team (Yılmaz, 2020) in both face-to-face and online learning environments (Arkün-Kocadere & Çağlar, 2015). Gamification aims to make the learning process more fun and interesting for students (Atabay & Albayrak, 2020; China, 2022; Koç-Avşar & Isabetli, 2017), to enable them to participate more in this process and to cope with some difficulties (Codish & Ravid, 2014), to interact (Kaya & Balta, 2016) and to work collaboratively (Cózar-Gutierrez & Sáez-López, 2016; Koç-Avşar & Isabetli, 2017; Pesare et al., 2016), to gain rich experiences about daily life (Kim & Lee, 2013), and to learn intuitively (Yılmaz, 2020). It is thought that with the inclusion of gamification in the foreign language teaching process, students will feel more comfortable, and procrastination behavior can be reduced by supporting participation in the process with activities that arouse curiosity and reduce anxiety. While games enable students to learn new words easily and feel more comfortable in writing or speaking in a fun environment, they also provide feedback to students and teachers about the development of the process (Kim et al., 2018). Gamification, which has a wide application area, also offers teachers the opportunity to update their teaching skills (Bahçeci & Uşengül, 2018).

Considering the predisposition of students to digital games in the recent period (Gürcan et al., 2008), it is indisputable that digital games will support the assignment process by gaining real-life experience such as learning new words, supporting interaction, and expressing themselves in a foreign language (Candan, 2022; Darfilal, 2015; Gömleksiz, 2005; Karataş, 2014). Despite the above-mentioned benefits of gamification, it is also criticized that it increases competition between the students, encourages a form of addiction (Hamari, 2014; Yıldırım & Demir, 2014), and sometimes reduces students' motivation to learn due to the reward system that it contains (Buckley & Doyle, 2016; Hanus & Fox, 2015). In this context, there is a need for research to be carried out regarding gamification in foreign language education, especially at the primary school level (Karataş, 2014; Özkan & Samur, 2017), taking into consideration the teaching objectives and the characteristics of the students (Çayır, 2021; Hanus & Fox, 2015; Kim, 2015), effective teacher guidance, and regular feedback (Özkan & Samur, 2017). In this study, it was aimed to evaluate the effectiveness of foreign language teaching carried out with gamification practices at the primary school level. In line with the overall aim of the study, this research seeks to answer the following research questions:

1. How does gamification in foreign language teaching affect the attitudes of the primary school students towards the lesson?
2. How is gamification in foreign language teaching evaluated by students?
3. How does gamification in foreign language teaching affect students' procrastination behavior?

Method

Research Design

This research utilized an embedded design mixed method approach to examine the effects of gamification practices on primary school students' attitudes, motivation, and procrastination behaviors. In this approach, both quantitative and qualitative data are collected, and the scope of the research is expanded (Çepni, 2010) so that more sources of findings and results can be presented (Christensen et al., 2015). The effect of gamification practices on students' attitudes and procrastination behaviors was tested in a quasi-experimental study, and the motivation of the students in this process was determined by semi-structured interviews. The research questions were simultaneously explained with the quantitative data and the qualitative data obtained from the interview, and the students' perspectives were also included in the process (Creswell, 2016).

Study Group

Since it was a rich situation in terms of information and in-depth research and descriptions were made, the study group of the research was determined by the purposive sampling method (Büyüköztürk et al., 2016; Ekiz, 2015). In line with the research purposes, the lesson, and the level of practice, the participation of fourth grade students was deemed more appropriate. A volunteer English teacher and primary school students were included in the study with gamification applications. Convenient case sampling was employed in order to reach this type of student easily (Christensen et al., 2015; Ekiz, 2015). The study group for the research was composed of 33 (20 boys and 13 girls) students who were in the fourth grade at a primary state school in Trabzon. Due to the ethical principles of the research, the English teacher, students, and parents were informed about the application, and their consent was obtained. In addition, in order to respect the private rights of individuals and to ensure confidentiality and ethical principles, the names of the institution and the teacher were not mentioned in the research report, and the students' names were coded as S1, S2, S3,..., S33 (Çepni, 2010; Ekiz, 2015).

Data Collection Tools

Research data were collected through ''Attitude scale towards English lessons in primary school. (Baş, 2012), a homework follow-up chart, and a semi-structured interview. The attitude scale consists of 27 items, 12 of which are reversed. Validity studies such as presenting the substance pool to the expert opinion, taking the returns, making the corrections, making the preliminary application, and explanatory factor analysis were carried out (Baş, 2012). Within the scope of reliability studies, the Cronbach Alpha reliability coefficient value (0.92) was found to be sufficient since it was above 0.70 (Cronbach, 1990; Pallant, 2010). In addition, the Spearman-Brown two-half test correlation value of the scale (0.83) was found to be exceptional since it was over 0.80 (Büyüköztürk, 2015).

The homework follow-up chart was created by the researchers to determine the time for students to complete their homework and procrastination behaviors during the usage of gamification applications. The opinions of a computer and teaching technologies teacher, a classroom teacher, and an English teacher were consulted for content validity. With these expert opinions, the chart was designed to record and track each student's progress in doing homework before and during the application and how long it took to do it (Büyüköztürk et al., 2016).

The semi-structured interview form, consisting of seven open-ended items, was designed by the researchers for primary school students to evaluate the teaching process based on gamification applications. It was developed so that the students could feel comfortable, the questions could be rearranged according to the progress of the interview, and in-depth information could be obtained. Firstly, draft questions were prepared with the purpose of the interview and the literature in mind. They were submitted to the opinion of three experts, one computer and instructional technologies expert, one classroom teacher, and one English language teacher for content validity (Büyüköztürk et al., 2016; Ekiz, 2015). Following their suggestions, questions about the negative aspects of gamification applications were added to the form.

Data Collection and Analysis

In this research, fourth grade students were provided with the opportunity to use gamification applications in English lessons. First of all, the course was taught in line with the curriculum for four weeks (eight course hours in total), and the students were given homework from the course resources used. The time for students to perform these assignments was included in the follow-up chart. The attitude scale was applied as a pre-test to the students before the teaching was carried out with gamification. Then, the students were informed about the application, the game components, how to access the task maps, how to complete the tasks, get points and achievements, and become members of the platform. It was explained to the students that they could create their

own avatars and play games with the virtual character, perform the tasks or homework set by the teacher individually or cooperatively, win awards, or be punished. Students completed the tasks and homework given for 4 weeks on this application (Figure 1). This period was kept for as long as possible to ensure the reliability of the research (Creswell, 2016; Ekiz, 2015).

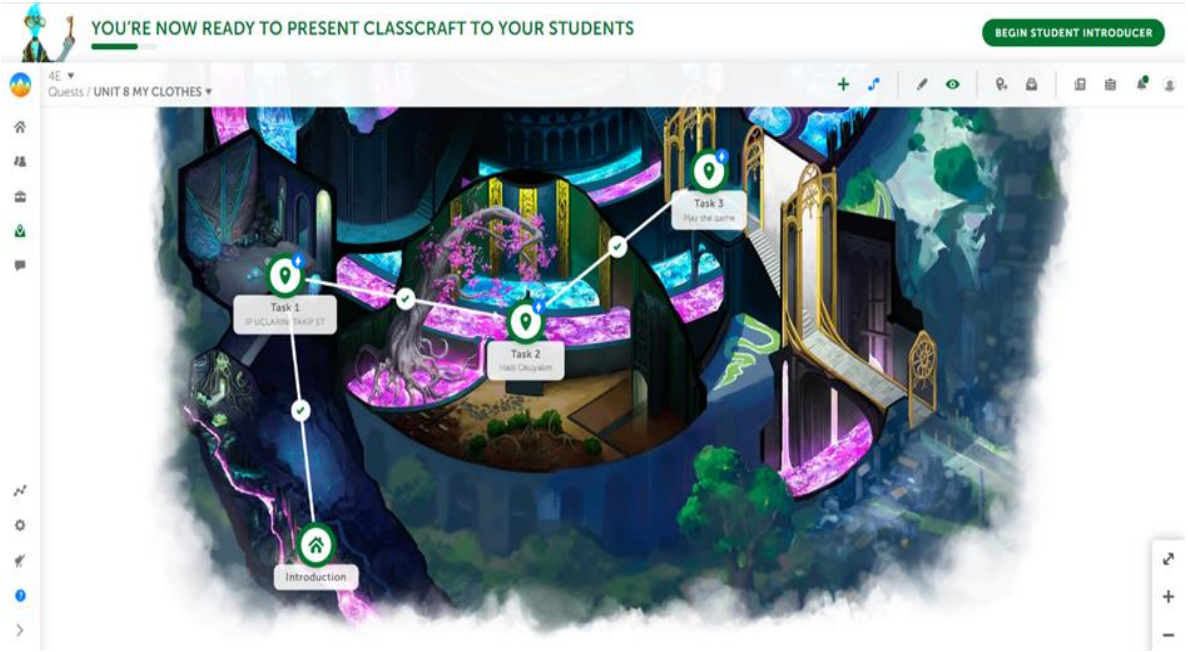

Figure 1. A sample of the task map

Activities based on the achievements in the teaching program were assigned to the task maps of the students (Figure 2). The duration for students to complete these tasks was taken from the system records and inserted in the follow-up chart. After gamification applications, an attitude scale was applied as the post-test. Finally, semi-structured interviews were conducted, recorded, and transcribed with the students to determine their evaluations of foreign language teaching with this application (Ekiz, 2015).

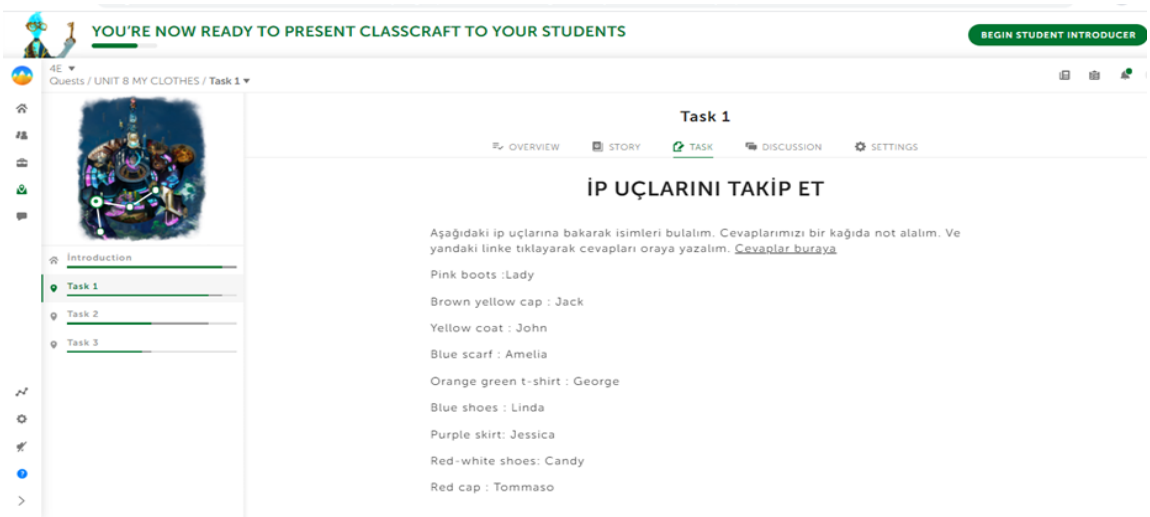

Figure 2. A sample of completed tasks

The data of the Attitude Scale were subjected to inferential statistics in order to statistically compare the mean scores of the students in the pre-test and post-test (Ak, 2014) and to make inferences about them (Christensen et al., 2015). First of all, the reversed items in the scale were reversed. Afterwards, the scale data were examined in terms of showing a normal distribution. When it was determined that the data were normally distributed, the dependent t-test, one of the parametric hypothesis tests, was employed (Karaatlı, 2014). The data in the homework follow-up chart were subjected to descriptive statistics to summarize with values such as frequency and mean (Christensen et al., 2015; Creswell, 2016). The average time for students to complete their homework

before and during the gamification application and the frequency of not doing it are presented in the table. The data from the semi-structured interviews with the students was subjected to content analysis. The data of the interview were analyzed deeply, and codes and themes were created according to the similarities of the meanings (Ekiz, 2015; Yıldırım & Şimşek, 2011). For the reliability of this research, the process was carried out by three researchers individually, and then a consensus was reached by discussing the findings (Creswell, 2016; Ekiz, 2015). These findings were presented in a more comprehensible and holistic way with charts. In addition, for the reliability of the research, the findings were supported by direct quotations from the students' opinions. The research process is summarized in Figure 3.

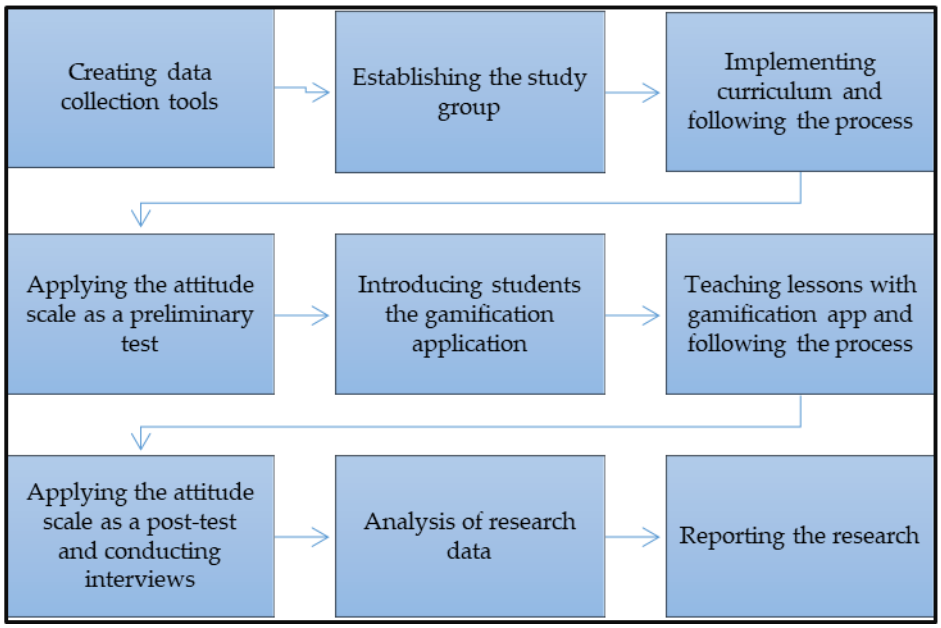

Figure 3. Process of the research

Findings

Findings on the Effect of Foreign Language Teaching Through Gamification Applications on Students' Attitudes towards the Lesson at the Primary School Level

The results of the dependent t-test performed to determine the effect of gamification on the attitude of primary school students are presented in Table 1.

Table 1. The impact of gamification apps on students' attitudes towards the lesson

Test	N	$\bar{X}$	Ss	Sd	t	p
Pre-test	33	93.24	20.31	32	-7.766	0.000
Post-test	33	107.82	16.26			

Table 1 reveals that gamification practices significantly increase the attitude of primary school students ($p<0.05$).

Findings on the Evaluation of Foreign Language Teaching with Gamification Applications by Primary School Students

The results of semi-structured interviews conducted to determine how students evaluate gamification apps in the teaching process are presented in this section.
The views of primary school students about the benefits of gamification applications are given in Table 2.

Table 2. Students' views on gamification apps

Advantages		Frequency
Cognitive	Facilitating learning	17
	Reinforcing learning	15
	Ensure permanent learning	12
Affective	Making the process fun	27
	Developing a positive attitude towards the process	26
	Increasing the willingness to participate in the lesson	11
	Increasing the desire to be successful	9
	Increasing learning curiosity	5
Behavioral	Ensuring task accomplishment	27
	Increasing the ability to use technology	8

According to Table 2, primary school students think that gamification practices have cognitive benefits such as facilitating learning, reinforcing what has been learned, and providing permanent learning. S9 states, *"Gamification allows us to learn faster. We understand the subjects better, and we do not forget them for a long time. We can play reinforcing games on the topics."* S18 states "*With this application, we can play games that summarize and consolidate the subject*. "*Students think that gamification apps have affective benefits such as ensuring the realization of tasks, making the process fun, developing a positive attitude towards the process, increasing the desire to participate in the lesson and be successful, and increasing the curiosity to learn. S8 states, "I started to think that studying was more fun, and I liked English lessons more. I am interested in it now." S10 also states, "I think the characters and missions are very entertaining in this virtual world. I like English more now because the lessons are more enjoyable." Students also believe that gamification has behavioral benefits, such as enabling tasks to be performed and increasing the ability to use technology. S3 states, "I liked the homework and tasks given in this application as we completed the tasks either by watching videos or by doing some kind of activity." S5 states "I started to learn by using technology and playing games. I didn't want to do my homework before; now I'm doing it more enthusiastically." The views of primary school students about the negative aspects of gamification applications are given in Table 3.*

Table 3. The negative aspects of gamification applications

Disadvantages		Frequency
System problems	Connection problem	7
	Not receiving feedback about the completion of the task	4
Task related problems	Not getting the items	6
	Simple tasks	5
	Being unhappy with the task map	4
	Difficult task	3
	Losing points due to uncompleted tasks	2

Table 3 reveals that primary school students report systemic disadvantages of gamification apps, such as experiencing connection problems and not receiving feedback on the completion of the task. Ö23 states, *"The application was frozen or didn't respond."* In addition, students think that the gamification app has some

functional disadvantages, such as not getting the character they want, the task being too simple, being dissatisfied with the task map, the task being more difficult than necessary, and losing points when the task is delayed. S12 states, *"I didn't like not getting the character that I wanted."*
The views of primary school students about using gamification applications in the lesson are given in Graph 1.

Graph 1. Students' views about using gamification in English lesson

According to Graph 1, the majority of primary school students expect gamification applications to be used in lessons. S2 states, "*I would like to use gamification in all lessons because we progress and learn more quickly."* Only four students stated that it should sometimes be used. S6 states, *"In fact, it may not always be the same, because I would like to do homework in our notebook."* Only two of them think that gamification shouldn't be used in lessons. S13 states, *"I don't want to use the game in class. I think books are more fun and educational."*

Findings on the Effect on Students' Procrastination Behaviors of Foreign Language Teaching with Gamification Applications at the Primary School Level

The results of the follow-up chart, which was created to determine the time for students to complete their homework and procrastination behaviors in the gamification processes, are given in Table 4.

Table 4. The effect on students' procrastination behaviors of foreign language teaching with gamification application

Duration	N	Average time to complete homework (day)	Frequency of students who have not done their homework at least once
Implementation of the teaching program	33	6.5	25
Using a gamification app	33	2	6

Table 4 reveals that the gamification application shortens the time students' doing their homework. In addition, with these applications, the situation of students not doing their homework has also decreased.

Discussion, Conclusion, and Recommendations

It is known that attitude has three dimensions: cognitive, affective, and behavioral (Karatay & Kartallıoğlu, 2016). In this study, it was determined that gamification applications significantly increased the attitude of primary school students towards the English lesson compared with classical teaching methods. Similar results have also been revealed by some other studies (Çayır, 2021; De-Marcos et al., 2014; Gelen & Özer, 2010; İnesi, 2022; Kalkan, 2016; Kunduracıoğlu, 2018; Meriç, 2022; Türkan, 2019; Yıldırım, 2016; Yıldırım, 2017). It can be stated that this effect is due to affective factors such as increasing interest and willingness to participate in the process (Çayır, 2021) with gamification applications. In this study, students stated that their attitude changed in a positive way due to the affective reasons in the semi-structured interviews. The affective element, which is also associated with the value judgments of the person, can be defined as liking the lesson in which the person has a positive attitude. A person with a positive attitude towards a lesson will have positive feelings towards the lesson and the content (Bilgin & Cengiz, 2019). The other dimension that supports the positive change in

attitude has been identified as cognitive elements. The cognitive element is the perception of a concept or situation. The affective element is related to feelings and emotions. These feelings are formed around the cognitive element. A person is made up of stimulants and experiences in his environment (Tavşancıl, 2006). The more confident the individual is in the authenticity of the information he or she obtains, the more the permanence of the attitude increases (İnceoğlu 2000). Shortly, the cognitive element consists of the knowledge and beliefs that people have around them. As a result of this research, another factor that positively supports the students' attitudes towards English lessons is the behavioral field. The literature supports this situation with the view that feelings formed by cognitive and affective elements are evaluated as good or bad and turned into behavioral elements (Karatay & Kartallıoğlu, 2016). The behavioral element can be expressed as the state of acting towards the object of an individual's attitude. The student who has a positive attitude towards a lesson will demonstrate behaviors that are aimed at reacting positively to this lesson. If he or she does not, he or she will be distracted from the lesson and the content (Bilgin & Cengiz, 2019). As a result of the research, it is supported in accordance with the literature that attitude consists of these three elements in the interaction of cognitive, affective, and behavioral, and that the change in one of these elements will affect the others (Karatay & Kartallıoğlu, 2016). Considering the positive effects of attitude on cognitive, affective, and behavioral dimensions and the positive opinions regarding the use of primary school students in this research, it can be stated that the practice of gamification can be used in teaching foreign languages and other lessons.

Another finding of this research is that gamification apps support the foreign language teaching process at the primary school level. Within the scope of the research, it is concluded that gamification facilitates the learning process in the interviews with primary school students and that what is learned has cognitive contributions such as reinforcement and permanent learning. In the literature, it has been determined that gamification facilitates students learning of vocabulary in foreign language education (Türkmen, 2022), provides reinforcement (China, 2022), and promotes permanent learning (Ak, 2022; Candan, 2022; İnesi, 2022; Meriç, 2022; Türkmen, 2022). The students who participated in the research stated that they considered gamification practices as fun, developing a positive attitude towards the process, supporting participation in the lesson, increasing their desire to be successful, and increasing their curiosity about learning. As a matter of fact, gamification apps create a fun learning environment (Ak, 2022; Candan, 2022; Çağlar & Arkun-Kocadere, 2015; China, 2022; Dicheva et al., 2015; Ertan, 2020; Inesi, 2022; Tunga, 2016); increase participation in English lessons (Abi, 2021; Tan et al., 2018); and other lessons (Candan, 2022; Ertan, 2020; Fidan, 2016; Fotaris et al., 2016; Hamari, 2014; Hong & Masood, 2014; Inesi, 2022; Juárez & Carballo, 2016; Kırcı & Kahraman, 2019; Pesare et al., 2016; Yellow & Altun, 2016; Karamert, 2019; Candan, 2022; Karamert, 2019; In this research, students stated that gamification applications also have behavioral contributions, such as enabling tasks to be performed and increasing the ability to use technology. In fact, gamification applications have many cognitive, affective, and behavioral benefits as they provide active learning and are found to be fun and interesting by students (Ertan, 2020; Fidan, 2016). As a result, gamification applications can be used to bring innovation to the learning process.

The criticisms of gamification applications in the research are issues such as having connection problems, the task being too simple or difficult, not being satisfied with the task map and the characters presented, and not receiving feedback about the completion of the tasks. Technical problems such as the inability to connect to the internet in digital-based games, access, and audio feedback are among the issues criticized in similar studies (Candan, 2022). In addition, negative situations such as the competitive environment for this application leading to pressure or conflict (Ağaoğlu, 2020; Ak, 2022; Candan, 2022; Hamari, 2014; Hanus & Fox, 2015; Yıldırım & Demir, 2014), stress (Çin, 2022), and time limitation (Ağaoğlu, 2020; Candan, 2022; Çin, 2022) have been revealed in the literature. While teaching with gamification, some system- or application-based disadvantages may be encountered, and in order to avoid these negativities in future applications and research, measures such as creating tasks and characters according to the levels and expectations of the students, continuous monitoring of the process, and instant guidance can be taken.

In this research, it was determined that the majority of primary school students think that gamification should be used in the teaching process because the gamification application increases attitude, desire, curiosity, fun learning, and enables active learning and performing tasks. In some studies in the literature, it has been determined that students have a positive attitude towards the use of this application in lessons (Ertan, 2020; Polat, 2014; Sarı & Altun, 2016), and students expect it to be used (Ak, 2022; Bayram & Çalışkan, 2019; Çilengir, 2019). However, two students who prefer to learn by reading and writing have expressed the opinion that this app should not be used in lessons. This can be explained by the fact that while these students have an auditory learning style (Dunn & Dunn, 1993), technology-enhanced teaching such as gamification is more appropriate for visual and kinesthetic learners (Gülay, 2021). In this context, gamification can be used to take into consideration that individuals prefer more visual and kinesthetic learning (McVay, 2004; Reid, 1987) and to ensure higher participation during the learning process.

One of the striking findings of the research is that the gamification application shortens the completion times of the homework given in the English lesson at the primary school level, and the behavior of not doing homework is seriously eliminated. In the interviews with the students involved in the research, it was revealed that this

situation was caused by the gamification application. In the literature, it was stated that gamification application increases the level of substantiation of students' tasks and homework (Brewer et al., 2013; Selvaslı, 2018), performance, and duration (Pesare et al., 2016). This can be explained by the fact that the gamification application includes fun and interesting components such as collecting points and rewards, character development, leveling up, and being different from the classic homework that has reading and writing activities that are time-consuming and boring (Duru & Cogmen, 2017; Soy, 2022). Zamki (2022) points out the possible causes of procrastination behaviors such as failure, negative thoughts about one's abilities, personal problems, unrealistic expectations, a lack of motivation and organizational skills, an inability to concentrate on work, fear, and anxiety. Procrastination stems from three basic cognitive styles that include unrealistic views of the self, others, and the world. At the end of the research, the fact that the answers given by the students in the interviews focused on these issues in the cognitive field also supports this situation and shows the effect of the process in reducing procrastination behavior. It can be stated that the results of the research have a positive effect on students' procrastination behaviors and can be used in homework assignments. A limited number of studies have found a link between procrastination behavior and gamification. It can be suggested that new and longer-duration research be carried out to examine this process deeply.

Authors Contribution Rate

All authors contributed equally to the research.

Conflicts of Interest

There is no conflict of interest.

Ethical Approval

Ethical permission (27.01.2023 - 2023-1/2.9) was obtained from Trabzon University Social and Human Sciences Ethics Committee for this research.

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Adaptation of the Job Stress Scale into Turkish

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Abstract

The aim of this research is to adapt the job stress scale developed by Parker in 1983 into Turkish and to conduct a validity and reliability study. Exploratory factor analysis of the job stress scale was conducted on a sample of 167 teachers and confirmatory factor analysis was carried out on a sample of 185 teachers. The 13-item scale was first adapted into Turkish and reviewed by field experts. As a result of the exploratory factor analysis of the five-point Likert-scale, a two-factor structure emerged and it is seen that this structure explains 69.336% of the total variance. According to the exploratory factor analysis, the scale items were collected in two clusters called job anxiety and time stress. This two-factor structure was confirmed by confirmatory factor analysis. Confirmatory factor analysis fit indices are at best fit and acceptable fit levels. This adaptation research whose validity and reliability were fulfilled was found to be compatible with the results of the scale developed by Parker. The Cronbach Alpha coefficient calculated to determine the reliability of the scale was determined as .843. The job stress scale is valid and reliable in the sample of teachers.

Keywords: Job anxiety, Time stress, Scale development, Factor analysis, Validity and reliability.

Introduction

The word “stress”, which etymologically comes from the root of “estrictia” in Latin, has been defined in different ways according to the relevant century. While it expressed negative meanings such as disaster, trouble, and grief in the 17th century, it involved meanings such as pressure, coercion, and constructive power for people, objects, and souls in the following centuries (Güçlü, 2001: 92). Today, it is defined as "mental stress" (Turkish Language Association: TDK, 2022). Although the origin of the word stress is Latin, it has passed from English to our language. The word stress is expressed by behaviorists as “the reaction of metabolism in the face of adverse situations” (Yamuç & Türker, 2015: 390). Once the literature is examined, numerous definitions of stress emerge. Özmutaf (2006:75) defines stress as individuals' reaction to environmental factors; Magnuson (1990) defines stress as the individual's reaction to the difference between their expectations and their real world; and Robins (1996) defines stress as a result of the voluntary or involuntary dynamic conditions that individuals face as a consequence of limitation or opportunity. According to these expressed definitions, we can define stress in the most general sense as the physical or mental reactions of the individual in order to adapt to the situation as a result of the extraordinary demands, exerted oppression, or encountered opportunities.

A job or working life is a crucial part of life in terms of social, cultural, and economic aspects. Working life, which corresponds to an important time period in the daily life process, causes the positive and negative burden on the mind of the individual to be experienced more intensely than other life events. Keser (2014:20) stated that the time spent at work covers a large part of people's lives, and therefore work stress has an important place in daily life. Therefore, work stress emerges as an important source of stress in daily life (Erkutlu & Chafra, 2006). Job stress is defined as the entity of the relationships between the demands, restrictions, and situations encountered in working life and personal characteristics (Draper et al., 2004). According to another definition, it is also defined as a negative situation or tension (Yenihan et al., 2014:39) that arises as a result of the interaction between the individual and her or his environment. In addition, the stress that is exposed prevents people from performing their daily work and causes them to react both physically and mentally (Gül, 2007: 319; Tekin, 2010: 33).

Parallel to the industrial revolution, the need for qualified manpower in societies came forth, and mass education was introduced to meet this need. The spread of mass education brought about the spread of the school system,

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and along with the prevalence of the school system, teaching began to be considered a profession (Aslan, Aslan, & Cansever, 2012; Eskicumalı, 2004). Teaching, which is recognized as a profession, has been defined as a profession made by experts who organize and implement teaching within the realms of a specific plan and program in line with determined goals (Yazar, 2015). In light of this information, it is an undeniable fact that teaching is a profession and that the teaching profession entails stress, as in every profession. As a matter of fact, it is known that teachers in schools are also faced with work stress, as in every institution. Today, teachers work in business environments dominated by many variables that affect the work environment and the process. Like every institution, schools have their own stress sources. It should not be ignored that there are sources of stress that are not encountered in other institutions in schools where the human element plays a leading role. For this reason, acknowledging the sources of stress that teachers and school administrators are exposed to is important for them to be successful in stress management.

As the literature is reviewed, the causes of stress encountered in working life have been collected under different headings by the researchers. The causes of stress are listed by McGrath (1976, cited in Ertekin, 1993) as task-dependent, role-played, depending on the environment in which the behavior takes place, depending on the physical environment, shaped according to the social environment, and depending on the individual himself. Cooper et al. (1988), on the other hand, divided them into five groups: organizational practices, job/task characteristics, organizational culture/climate, interpersonal relations, and personal characteristics of employees. Eroğlu (1998) classified the causes of stress into six groups: general stress causes, environmental conditions, economic conditions, social life, working life, and personality structure.

When the studies on job stress in the literature are examined, the sample of the studies has always been selected from different occupational groups. As a matter of fact, Balcı (1993) carried out studies on university lecturers, Gümüştekin & Öztemiz (2004) carried out studies on flight crew, Demiral et al. (2007) carried out studies on municipal employees, Soysal (2009) carried out studies on employees in different sectors, Ersan et al. (2012) carried out studies on health care professionals, Tuna & Baykan (2013) carried out studies on oncology nurses, Avcı (2018) carried out studies on social workers, Çiçek (2020) carried out studies on civil aviation personnel, and Gürbüz (2020) carried out studies on university administrative staff. Besides, there are many studies abroad that demonstrate that teachers experience burnout and high levels of job stress (Abel & Sewell, 1999; Cox & Brockley, 1984; Farber, 1984; Feitler & Tokar, 1982; Kyriacou & Sutcliffe, 1978). In addition, Ünal (2000), Bulut (2005), and Erkmen & Çetin (2008) conducted studies on teachers' styles of coping with stress. In this context, no study has been found in Turkey on the determination of teachers' job stress levels. With this study, it is aimed at developing a scale to determine teachers' job stress. The research is important in terms of eliminating this shortcoming in the literature. For this purpose, the job stress scale developed by Parker in 1983 was adapted to Turkish, and a validity and reliability study was conducted.

Method

This research, using the descriptive scanning method, was carried out on two different samples with the participation of teachers working in Hakkari province and its districts. 167 teachers randomly selected from the population of Hakkari province constitute the sample of exploratory factor analysis (EFA), and 185 teachers randomly selected from the population of Hakkari districts constitute the sample of confirmatory factor analysis (CFA). The difference between EFA and CFA samples stemmed from the difference in the number of teachers working in the provinces and districts that make up the universe. Of the 167 teachers who were EFA participants, 93 (56%) were women and 74 (44%) were men. Of the 185 teachers who were CFA participants, 107 (58%) were women and 78 (42%) were men.

The Job Stress Scale developed by Parker in 1983 was used in the research. The 13-item scale was first adapted into Turkish and reviewed by field experts. Responses to the 5-point Likert-type Job Stress Scale were scored based on "(5)-totally agree", "(4)-agree", "(3)-undecided", "(2)-disagree" and "(1)-totally disagree". In order to test the construct validity of the 13-item scale, the Cronbach's Alpha test was used to test the reliability of EFA and CFA.

In the study, first of all, the data were reviewed in terms of extreme values and missing data, and their suitability for factor analysis was tested to determine whether they showed a normal distribution. As a result of these preliminary evaluations, it was determined that the scale was suitable for factor analysis, and then EFA and CFA were performed.

Moreover, regarding the sample size, Muthén & Muthén (2002), Bollen (1989), and Bentler & Chou (1987) stated that 5–10 times the number of items in the scale would be sufficient, while Anderson & Gerbing (1984)

stated that the selected sample would be sufficient. They stated that it should be greater than 100. Considering these criteria, it is seen that the sample size in this study is sufficient for EFA and CFA.

Findings

Among the statistical techniques, factor analysis is used to obtain information about the dimension structure of measurement tools and the items to be collected in these dimensions (Baykul, 2000). The process before factor analysis is to test the adequacy of the sample size (Tabachnick & Fidell, 2001). Çokluk et al. (2010) stated that the Kaiser-Meyer-Olkin (KMO) test is an instructive guide for sample adequacy in factor analysis and that the sample size should take a value between .80 and .90 for it to be considered "good". Leech, Barrett, and Morgan (2005) state that factor analysis cannot be performed if the value obtained according to the KMO test result is less than .50, and Field (2005) and Pallant (2001) state that factor analysis cannot be performed if the value obtained according to the KMO test result is less than .60. During the development of the job stress scale, the KMO value was found to be .821, and it was determined that the sample was "good" and suitable for factor analysis. In addition, the results of the Bartlett Sphericity test (χ^2)=1255.890, sd = 55, p =.000) demonstrate that the data show a multivariate normal distribution and are suitable for factor analysis (Çokluk et al. 2010).

EFA and principal component analysis, which are dimension reduction techniques, are frequently used by researchers to obtain information about the component and factor structure of data collection tools (Costello & Osborne, 2005). Since it is known that the vertical rotation method in EFA facilitates the interpretation of the results obtained (Rennie, 1997), the varimax rotation method was used in EFA (Tatlıdil, 1992). In addition, the scree plot, which allows us to visually evaluate the factor structure, was examined. Significant changes observed in the curve in the scree plot are guiding factors in deciding the factor structure (Ledesma, Valero-Mora, & Macbeth, 2015). Contrary to statistical data, this approach is frequently used, although it is criticized for being intuitive (Zwick & Velicer, 1986). The scale consisting of 13 items was excluded from the scope of the two overlapping items, and an EFA of 11 items was performed. The scree plot obtained as a result of the EFA of the Job Stress Scale is given in Figure 1.

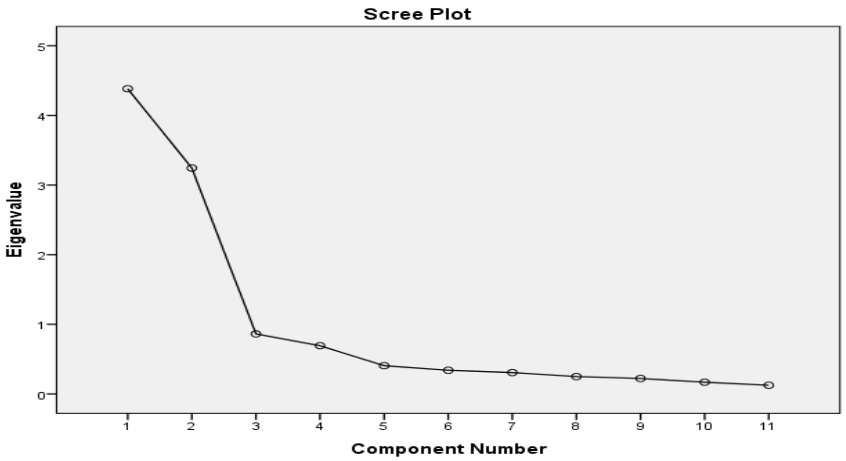

Figure 1. Scree Plot

The aim of the Scree Plot is to reveal the number of dominant factors (Çokluk et al. 2010). As a matter of fact, an indicator of the number of factors is the accelerated or rapid declines in the scree plot (Büyüköztürk, 2002). In addition, horizontal lines are used for the explained variance. By examining the scree plot, the components of the point on the graph where the slope starts to disappear or the accelerated decline begins have been determined (DeVellis, 2017). According to Figure 1, the point where the slope started to disappear occurred after the second factor. In light of this information, it can be said that the scale has a two-factor structure. However, while deciding on the factor structure of the scale as well as the scree plot, attention was paid to ensuring that the eigenvalue of each factor should be greater than 1. It was determined that the eigenvalue of the third factor was less than 1, and it was decided that the job stress scale had a two-factor structure. The ratio of variance explained for each factor as a result of the EFA of the job stress scale, Bartlett's Test of Sphericity values, KMO values, Cronbach Alpha reliability coefficients for the whole scale, and each dimension are given in Table 1.

Table 1. The Explained Variance, Bartlett's Test of Sphericity, KMO, and Alpha Coefficients of the Job Stress Scale

Variance				
Dimension	Explained (%)	Cumulative (%)	Cronbach Alpha	KMO
Factor 1	37.973	37.973	.911	.821
Factor 2	31.363	69.336	.886	
			Bartlett's Test χ^2= 1255.890; SD= 55; P= .000	
			Total Scale (Cronbach Alpha Coefficient)	.843

According to Table 1, the scale has a two-factor structure consisting of 11 items, and it is seen that this structure explains 69.336% of the total variance. It is seen that the first factor (F1) explains 37.973% and the second factor (F2) explains 31.363% of the variance. In addition, when the whole scale is considered, Cronbach's Alpha coefficient was found to be .843. When Cronbach's Alpha coefficient for each factor was calculated, it was .911 for the first factor and .886 for the second factor. The two-factor structure of the work stress scale and the factor loads of the items that make up the structure are as in Table 2.

Table 2. Item Factor Loads of the Job Stress Scale

Strategical Dimension	Items	Item Factor Load
Factor 1	a4	.874
	a11	.857
	a8	.833
	a6	.810
	a10	.809
	a2	.802
Factor 2	a3	.862
	a5	.858
	a1	.843
	a9	.809
	a7	.763

According to Table 2, it is seen that the item load values of the scale vary between .763 and .874. When the items clustered under the factors were reviewed, it was determined that the first factor was related to "Time Stress" and the second factor was related to "Job Anxiety", and labeling of the factors was done in this way. In order to determine the accuracy of the scale, which was determined to have a two-factor structure as a result of EFA, the CFA process was initiated, and the results in Figure 2 were obtained.

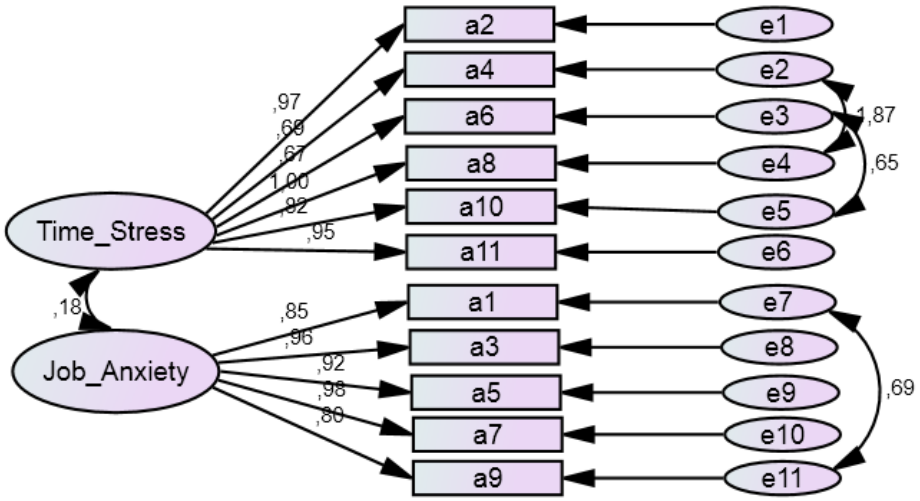

Figure 2. Confirmatory Factor Analysis Results

Figure 2 shows the correlation and error values of the two-factor structure of the job stress scale. Considering the error values, it was decided to adjust the fit indices, and modifications were made in three spots (between

items a4–a8, a6–a10, and a1–a9). The fit index values of the job stress scale obtained after these modifications are summarized in Table 3.

Table 3. Results of the Job Stress Scale by Confirmatory Factor Analysis (CFA)

Indexes and Measurement	Best fit*	Acceptable Fit*
$X^2/sd=2.421$	***0≤measurement<3***	3<measurement≤5
GFI=.914	.95≤measurement≤1.0	***.90≤measurement≤.95***
AGFI=.979	**.90≤measurement≤1.0**	*.85≤measurement≤.90*
CFI=.979	***.95≤measurement≤1.0***	.90≤measurement≤.95
RMSEA=.088	0≤measurement≤.05	***.05≤measurement≤.08***
SRMR=.0308	***0≤measurement≤.05***	.05≤measurement≤.08

*[Çokluk, Şekercioğlu & Büyüköztürk (2010); Hu & Bentler (1999); Meydan & Şeşen (2011); Şimşek Sümer (2000); Tabachnick & Fidell (2001)]

When Table 3 was examined, some of the fit indices (χ^2/sd; AGFI; CFI; and SRMR) were found to have the best fit, while others (GFI and RMSEA) were found to be at acceptable fit levels. According to these values, the two-factor structure revealed by EFA was confirmed by CFA. The correlation matrix between the overall scale and each dimension is given in Table 4.

Table 4. Job Stress Scale Correlation Matrix (N=185)

		Job Anxiety	Time Stress	Total
Job Anxiety	Correlation Coefficient (r)	1		
	p			
Time Stress	Correlation Coefficient (r)	.179	1	
	p	.015		
Total	Correlation Coefficient (r)	.715**	.816**	1
	p	.000	.000	

When the correlation analysis results in Table 4 were examined, it was determined that there were significant and .01 positive relations between the whole scale and both dimensions. Another result in the table is that the highest correlation is between the whole scale and time stress (r =.816, p =.000), and the lowest relationship is between the whole scale and the job anxiety dimension (p =.715, p =.000).

Conclusion and Discussion

Within the scope of this research, the Job Stress Scale, which was adapted into Turkish and whose validity and reliability studies were carried out, was developed by Parker in 1983. Responses to the 5-point Likert-type Job Stress Scale were scored based on "(5)-totally agree", "(4)-agree", "(3)-undecided", "(2)-disagree" and "(1)-totally disagree". Although it consists of 13 items, the final version of the scale consists of 11 items because two overlapping items are excluded from the scope. EFA and CFA were used to determine whether the scale met the validity criterion.

It is sufficient for the item factor load to have a value of .32 and above (Tabachnick & Fidell, 2001). In addition, Hair et al. (2010) stated that the item factor load should be .50 and above. On the other hand, Comrey & Lee (1992) described the item load value as "very good or excellent," provided that the item factor load was .63 or above. According to these evaluations, it is possible to characterize all item factor loads on the job stress scale as excellent.

The scale, which consists of eleven items, has a two-factor structure, and has an eigenvalue above 1, explains 69.336% of the total variance. This determined ratio is seen as sufficient (Scherer, Wiebe, Luther, & Adams, 1988; reported by Tavşancıl, 2014:48). When each factor is considered, it is seen that the first factor (F1), consisting of six items, explains 37.973% of the variance, and the second factor, consisting of five items, explains 31.363% of the variance. Considering the two-factor structure of the scale, there are six items in the first factor and five items in the second factor. As a matter of fact, as Costello & Osborne (2005) stated, a factor containing two or fewer items is generally unstable and weak. According to this view, we can say that the scale has a stable and strong structure. In addition, the explained variance is an indicator of the developed scale, and it is sufficient for the explained variance to be between 40% and 60% (Çokluk et al. 2010). Consequently, we can assert that the job stress scale is suitable for the specified criteria, according to the number of items clustered in each factor and the variance explained.

When the item expressions of the scale were reviewed, the factor names were assigned in this way because the first factor was clustered as "Time Stress" and the second factor as "Job Anxiety". Because when naming factors (labeling), they should be labeled in accordance with an institutional structure, items with a high load value should be taken into account, and it should be taken into account that these items are gathered in the same cluster due to the common feature (Şencan, 2005).

CFA is performed to test the accuracy of the factor structure obtained as a result of EFA and to determine its theoreticity (Eroğlu, 2005; Gürbüz & Şahin, 2017). In the evaluation of the model established with DFA, fit indices such as GFI, AGFI, CFI, χ^2/sd, RMSEA, and SRMR are used. Beauducel & Wittmann (2005) stated that these fit indices provide the most valid information for evaluating CFA results. GFI and CFI fit indices take values ranging from 0 to 1. Among these fit indices, Sümer (Sümer, 2000) indicates that it is acceptable for the GFI value to be .85 and above, Sivo et al. (2006), Perry et al. (2015) indicate that it is a good fit between .90 and .95, and Baumgartner & Homburg (1996), Erkorkmaz et al. (2013), Hu & Bentler (1999), Schreiber et al. (2006), Schermelleh-Engel et al. (2003), and Marsh et al. (2006) indicate that it is an excellent fit between the model and the data. Similarly, it is acceptable for the CFI value to be .90 and above, and a value of .95 and higher is interpreted as an indication of perfectness in terms of the data (Sümer, 2000; Şimşek, 2007).

The corrected Chi-square statistic (χ^2/sd) is one of the most important criteria for model fit. A score below five is considered moderate or acceptable (Bollen, 1989; Sümer, 2000), while a score below two or three is interpreted as having a perfect fit (Schreiber et al., 2006). Since the corrected Chi-square statistics (Özdamar, 2013), which is an index sensitive to the number of items and sample size, will not be sufficient alone, RMSEA and SRMR values, which are other fit indices, should also be taken into account. Yaşlıoğlu (2017:81) stated that RMSEA and SRMR values give the most reliable information about the model. RMSEA and SRMR values of .08 or less are acceptable (Schreiber et al. 2006), while values close to zero or less than .05 indicate a perfect fit (Sümer, 2000). The last index value to be considered for DFA is the AGFI index. The acceptable value for this index is .80 and above (Sümer, 2000).

Considering the fit indices obtained as a result of the CFA of the job stress scale, it is seen that they are in harmony with the reference values stated in the literature. As a matter of fact, it was determined that (χ^2/sd; AGFI; CFI; and SRMR) had a good fit, while some (GFI and RMSEA) were at an acceptable level of fit, and the two-factor structure in EFA was confirmed according to CFA.

Finally, to test the reliability of the job stress scale, Cronbach's Alpha reliability coefficient was calculated and found to be .843. It had been stated that the Cronbach Alpha reliability coefficient was accepted as excellent above .90, high between .80 and .90, and reliable between .70 and .79 (Cohen et al. 2007). It has also been stated that the number of items in the scale is low or that the acceptable level of Cronbach's Alpha reliability coefficient in newly developed scales is .60 and above (Child, 1970; Nunnally, 1978; reported by Alemdar & Köker, 2013). As a result of this information, it was decided that the job stress scale is valid and reliable for teachers.

Author (s) Contribution Rate

The article was written by a single author.

Conflicts of Interest

There are no conflicts of interest regarding the publication of this paper.

Ethical Approval

Ethical permission (03.04.2023-2023/38) was obtained from Hakkari University Scientific Research and Publication Ethics Committee for this research.

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