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CONTENTS

Understanding Teachers' Classroom Management Anxiety: The Role of Educational Technology Usage in Classrooms

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Article Info	ABSTRACT
	The aim of this study is to reveal whether there is a significant relationship between level of teachers' use of educational technologies and classroom management anxiety. The research was structured with relational survey model which is one of the survey models. The study group of the research consists of teachers working in pre-school, primary, secondary, and high schools in Amasya in the 2021-2022 academic year. The research sample consisted of 159 teachers who completed the data collection tools voluntarily. In the study, Levels of Educational Technology Usage Scale and Classroom Management Anxiety Scale were used as data collection tools. In the results of the research, it was determined that there was a significantly weak and negative relationship between the level of teachers' use of educational technologies and their classroom management concerns. It was also inferred that the use of educational technologies explained approximately 11% of the total variance of classroom management anxiety. When the levels of teachers' use of educational technologies were examined according to the variables of gender, age, and educational status, it was determined that there was a significant difference, but no significant difference was found according to the school type variable. Additionally, when the classroom management anxiety of the teachers was examined, it was seen that there was a significant difference as per the gender variable, while there was no significant difference as per the educational status, school type and age variables.

INTRODUCTION

In parallel with the changing world, developments in technology have concluded that people should update themselves and keep up with this process. In this context, teachers, who are primarily responsible for the student, can use the educational technologies necessary for the transfer of knowledge in the education process. However, ensuring the active participation of students in the lesson, producing solutions for possible problems, etc. are necessary factors for effective classroom management. In this context, the change of educational environments and teachers' professional competencies has become mandatory (Basaran et al. 2021). In the modern age, teacher qualifications are critical for students to acquire 21st-century skills and to improve their educational environment (Erdem & Kıngır, 2022). The role expected from teachers in educational environments is not only to present the information available to the students, but also to interpret the achievements gained by following the new developments with a critical perspective and to share the current and correct information with their students (Dargut & Çelik, 2014). In this direction, teachers are expected to use technological tools at a level that meets the interests and needs of students and to increase their skills in using these tools (Sprott, 2019). The effective and correct use of technology in educational environments both increases the quality of education and facilitates the learning processes of students (Ersoy & Gürgen, 2021). It is obvious that not using technology effectively and correctly can affect both the quality of education and learning processes negatively. Additionally, students who use technology very effectively expect teachers to be experts in the use of information technologies and to guide them (Revilla Munoz et al., 2017). It is thought that teachers may be concerned about their deficiencies in using technology skills by students. In this context, this study was conducted to examine the relationship between teachers' level of use of educational technologies and classroom management anxiety. It is thought that by revealing this relationship, it will contribute to intervention studies aimed at reducing teachers' classroom management anxieties, showing more effective classroom management skills, and creating a quality teaching environment. Additionally, the findings of this research are expected to contribute to the studies on reducing teachers' classroom management anxieties, improving classroom management competencies, and improving teachers' educational technology competencies. In this direction, answers to the following research questions were sought to achieve the aims of the research.

1. Is there a relationship between teachers' use of educational technologies and classroom management anxiety levels?

2. Does the level of teachers' use of educational technologies significantly predict classroom management concerns?

3. Does the relationship between the level of use of educational technologies and the level of classroom management anxiety differ according to gender?

4. Does the relationship between the level of use of educational technologies and the level of classroom management anxiety differ according to age?

5. Does the relationship between the level of using educational technologies and the level of classroom management anxiety differ according to the type of school?

6. Does the relationship between the level of use of educational technologies and the level of classroom management anxiety differ according to the level of the school from which the teachers graduated?

Teachers' Levels of Use of Educational Technologies

The emergence of the concept of educational technology and the use of technology in education has impacted our education system as well as in the education system of many countries (Arslan et al., 2022). Educational technology is defined as a tool used in education and training fields to make students' learning processes more efficient (Huang, Spector & Yang, 2019). It is critical for teachers to

use educational technologies effectively and to blend these technologies with field knowledge and to make education and training environments productive (Bayrak & Bayrak, 2021). It is expected that teachers' technological competencies to be expected to be high to use educational technologies beneficially in learning environments (Doğru et al., 2017). This is because the teacher is the person who guides the use of technology in learning environments (Şengür & Anagün, 2021).

It is possible to say that teachers should not only use technology effectively, but also actively use these technologies in the classroom environment. However, it is not easy for teachers to abandon traditional methods and use educational technologies in learning processes (Aksoğan & Bulut Özek, 2020). Although there are efforts to increase teachers' use of educational technologies in our country, it is seen that the level of teachers' use of educational technologies has not reached the desired level (Dağ, 2016). It is stated that the number of teachers who do not use educational technologies in the classroom environment is high in these periods, as access to technology is easier in educational environments (Bilgiç, 2021). It has been observed that teachers have difficulties in using technology such as using distance education tools such as EBA and ZOOM, using computers, and preparing digital materials, especially in the distance education process (Basaran et al. 2021).

Adeoluwa et al. (2013) found in their study that teachers and students in secondary education institutions have low levels of educational technology use. Although primary school teachers regard their level of use of educational technologies as high according to their own statements, there are indications that various courses and seminars are needed in the integration of technology into education (Safa & Arabacıoğlu, 2021). Bolat et al. (2020) stated that most of the branch teachers working in secondary schools have high technology usage levels but low educational technology usage levels. Similarly, Bozkurt and Cilavdaroğlu (2011) stated in their study that teachers consider themselves competent in using technology, but they are unsuccessful in integrating technology into their lessons. The studies in the literature examined demonstrate that although teachers use technology at a high level, their level of integrating technology into the lesson and their use of educational technologies are lower (Başaran et al. 2021; Safa & Arabacıoğlu, 2021; Bolat et al. 2020). Based on the related studies examined; it is predicted that teachers' effective use of educational technologies in teaching processes will increase their classroom management skills and reduce classroom management anxiety.

Classroom Management Anxiety by Teachers

Classroom management, which is expressed as one of the most difficult tasks for teachers (Jones & Jones, 1998), is defined as the whole of the activities carried out to make the classroom ready for learning by providing coordination between teacher, student, curriculum, time, place, method, content, and technology. (Saritas, 2006). In the classroom of a teacher who has effective classroom management knowledge and can apply classroom management strategies well, discipline problems are rarely seen, students' participation rate is high, and learning occurs more easily (Emmer & Stough, 2003). Similarly, it is important for teachers to use all competencies related to their field in the classroom environment to create an effective learning environment (Demirtaş, 2012). It is seen that the success of the students in the classrooms of the teachers who perform the classroom management effectively is higher (Çakmak et al., 2008). For this reason, effective classroom management skills are necessary to increase students' participation and success in the lesson.

Teachers' responsibilities, such as increasing efficiency in learning environments, planning in the classroom environment, responding to students' requests to be role models, ensuring discipline in the classroom environment, achieving success in the classroom, etc. make the classroom management anxiety levels of teachers more comprehensible (Breen & Lindsay, 2002). Teachers without a good command of their field, sufficient knowledge, and experience, and who cannot fully use the materials they have, experience anxiety (Uçak & Bindak, 2017). Additionally, teachers' lack of knowledge about classroom management, personality traits and inexperience cause them to experience anxiety (Oral, 2012).

Gezen (2021), in his study on determining the classroom management concerns of secondary school teachers, stated that the classroom management concerns of the participants were high. In the study by Sadık and Nasırcı (2019), it was stated that the classroom management anxieties of teachers working in high schools were low, while vocational course teachers working in vocational high schools had higher classroom management concerns compared with teachers working in other branches. The high level of classroom management anxiety of teachers negatively affects their performance in the classroom (Gezen, 2021). In this context, it is possible to say that classroom management is a prerequisite for teachers' quality and effective teaching, and that classroom management anxiety is a factor affecting the education process.

It has been stated that this classroom management anxiety can reduce the professional pleasure of teachers and reveals a professional burnout (Özer et al., 2016). It has been observed that teachers who use educational technologies effectively have high classroom management skills (Varank & İlhan, 2013). Similarly, Güneş and Buluç (2018) found in their study that there is a significant relationship between teachers' classroom management skills and their level of technology use. It is revealed that teachers' classroom management concerns are a remarkable issue, and this concern may be caused by the lack of educational technology usage in the education process, and this relationship needs to be revealed.

Purpose and Importance of the Study

When the literature is examined, it is revealed that classroom management anxiety is an important issue that should be emphasized. Although there are many studies on teachers' classroom management skills, the scarcity of studies on teachers' classroom management anxiety has drawn attention. The lack of studies in the literature on classroom management anxiety, which negatively affects the performance of teachers in the classroom (Mishra & Yadav, 2013), causes damage to their self-confidence, and even affects them to quit the profession (Ingersoll & Smith, 2003). This demonstrates the need for further studies. It has been stated that teachers' use of educational technologies will positively contribute to their successful display of classroom management skills and reduce classroom management concerns (Güneş & Buluç, 2018). This study aims to examine the relationship between teachers' level of use of educational technologies and classroom management anxiety on that sense.

METHOD

Research Design

This study, which reveals the relationship between teachers' levels of technology use in education and classroom management concerns, was conducted as a descriptive study in the survey model. Karasar (2002) defines the survey model as a survey model that shows whether there is a significant difference between the groups formed between more than one variable according to the dependent variable.

Participants

The group of this study consists of teachers working in Amasya Provincial Directorate of National Education. The study group consists of 161 teachers selected by appropriate sampling management from the teachers working in various schools. Two teachers with extreme values affecting the normal distribution of the data were excluded from the study group and the analysis were made on the data of 159 teachers. The distribution of the study group by gender, educational status, age and school types is summarized in Table 1.

Table 1. *Distribution of demographic characteristics*

Variable	Category	N	%
Gender	Female	103	64.8
	Male	56	35.2
Educational Status	Associate Degree	4	2.5
	Bachelor's degree	131	82.4
	Master's Degree	24	15.1
Age	23–30	18	11.3
	31–40	65	40.9
	41–50	49	30.8
	51–60	27	17.0
Type of School	Pre-school	2	1.3
	Primary school	27	17.0
	Secondary school	52	32.7
	High school	78	49.1

When the data in Table 1 are examined, it is seen that the number of female teachers in the study group is 103 (64.8%) and the number of male teachers is 56 (35.2%). 131 people (82.4%) have undergraduate degrees, 24 people (15.1%) have master's degrees and 4 (2.5%) people have associate degrees considering their educational status. 65 (40.9%) of the teachers are between the ages of 31–40, 49 (30.8%) are between the ages of 41–50, 27 (17.0%) are between the ages of 51–60, and 18 (11.3%) are between the ages 23–30. The highest level of participation was at the high school level, while the least participation was at the pre-school level when the distribution of the teachers in the study group according to the type of school, they work in is examined

Research Instruments and Processes

Data were collected using two scales within the scope of the study. The Levels of Educational Technology Usage developed by Bayraktar (2015) was used to measure teachers' level of use of educational technologies, and the Classroom Management Anxiety Scale developed by Özkul and Dönmez (2019) to measure classroom management concerns.

Ethics committee approval was obtained primarily during the collection of research data. After approval, necessary permissions were obtained to fill in the scales by the sample group. data were collected online by the researcher. The link address of the scale was sent to the schools in an official letter and the scale was filled by the teachers. The data were collected on a voluntary basis among teachers working in preschool, primary school, secondary school, and high school. The data collection process took approximately 4 weeks. The scales were applied to 161 teachers working in schools of the Provincial Directorate of National Education in Amasya.

Levels of Educational Technology Usage Scale

The Levels of Educational Technology Usage scale developed by Bayraktar (2015) is a 5-point likert ("Totally Agree" (5) - "Totally Disagree" (1)) type and consists of 38 items. The first sub-dimension "Technology Literacy" consists of 19 items, the second sub-dimension "Technology Integration in the Course" consists of 9 items, the third sub-dimension "Social Ethics and Legal Provisions" consists of 6 items, and the fourth sub-dimension "Communication" consists of 4 items. The total variance explanation rate of the scale was determined as 62.89. The Cronbach Alpha internal consistency coefficient of the scale was .975, and the Cronbach Alpha values of the sub-dimensions were .959, .912, .901, and .767, respectively.

Classroom Management Anxiety Scale

The classroom managemIent anxiety scale, developed by Özkul and Dönmez (2019), is a 5-point likert ("Totally Agree" (5) – "Totally Disagree" (1)). Classroom management anxiety scale consists of three dimensions and 23 items. The first sub-dimension of the scale "Communication Anxiety" consists of 4 items, the second sub-dimension "Motivational Anxiety" consists of 8 items and the third sub-

dimension "Time Management Anxiety" consists of 11 items. The total variance explanation rate of the scale was determined as 65.83%. The Cronbach Alpha value of the scale was found to be .953 for the first sub-dimension, .922 for the second sub-dimension, .794 for the third sub-dimension, and .960 for the total scale.

Data Analysis

Firstly, the normality test was conducted to determine the tests to be used to analyze the opinions of the teachers within the scope of this study. The skewness and kurtosis values for all scales and their sub-dimensions are shown in Table 2.

Table 2. *Skewness and kurtosis values of scales and sub-dimensions*

Scale	Sub-Dimension	n	Skewness	Kurtosis
Levels of Educational Technology Usage	Technology Literacy	159	-.10	-.928
	Technology Integration in Class	159	-.489	-.421
	Social Ethics and Legal Provisions	159	1.126	.281
	Contact	159	-.309	-.350
	Total	159	-,227	-.418
Classroom Management Anxiety	Communication Anxiety	159	-1.124	.625
	Motivational Anxiety	159	-.910	.-126
	Time Management Anxiety	159	-.956	-.355
	Total	159	-.904	-,296

If the skewness and kurtosis values of the data are between +1.5 and -1.5 in the normality distribution test, it is stated that the data provide the normal distribution assumption (Tabachnick & Fidell, 2013). According to Table 2, it is seen that the skewness and kurtosis values of the scales and sub-dimensions are within the specified range. In this respect, our data provide the assumption that it has a normal distribution.

Multivariate analysis of variance (MANOVA) was performed to determine the differences between binary and multiple variables, as it provided the assumption of a normal distribution of the data. Correlation and multiple regression analyzes were performed to determine the relationship between the variables. In the multiple regression analysis, the effect of educational technology usage levels on classroom management anxiety was examined and educational technology usage levels were determined as the independent variable (predictor). Classroom management anxiety was determined as the dependent variable (predicted) due to the assumption that teachers could be affected by their educational technology use proficiency.

Ethic

The necessary ethics committee permissions for the research were obtained from the Social Sciences Ethics Committee of Amasya University with the decision dated 02.11.2021 and numbered 40960.

FINDINGS

Descriptive Findings

The "Level of Educational Technologies Usage" scale of teachers and the arithmetic mean and standard deviation values of the sub-dimensions is shown in Table 3.

Table 3. *Mean and standard deviation values of educational technologies usage levels scale*

	Sub-Dimensions	n	$\overline{x}$	sd
Levels of Educational Technology Usage	Technology Literacy	159	3.36	.99
	Technology Integration in Class	159	3.92	.77
	Social Ethics and Legal Provisions	159	4.50	.72
	Contact	159	3.50	.98
	Total	159	3.69	.75

When the results of the teachers' use of educational technologies in Table 3 were examined, the average value of the scores obtained from the scale of the teachers' use of educational technologies was found to be 3.69. When the results are examined according to the sub-dimensions, it is seen that the sub-

dimension of social ethics and legal provisions ($\overline{x}$= 4.50, sd=.72) has the highest level.

The teachers' "Classroom Management Anxiety" scale and the arithmetic mean and standard deviation values of the sub-dimensions are summarized in Table 4.

Table 4. *Mean and standard deviation values of the classroom management anxiety scale*

	Sub-Dimensions	n	$\overline{x}$	sd
Classroom Management Anxiety	Communication Anxiety	159	4.04	1.09
	Motivational Anxiety	159	3.99	1.06
	Time Management Anxiety	159	3.86	1.29
	Total	159	3.93	1.11

When the results of the analysis to determine the Classroom Management Anxiety of the teachers in Table 4 were examined, the average value of the teachers' scores from the classroom management anxiety scale was found to be 3.93. When the results are examined according to the sub-dimensions, it is seen that the communication anxiety ($\overline{x}$= 4.04, sd=1.09) sub-dimension has the highest level.

Relational Findings

Correlation analysis was conducted to determine the relationship between teachers' level of use of Educational Technologies and classroom management anxiety. Before the analysis, the results of the analysis performed to determine whether the data met the assumption of normal distribution is shown in Table 2 and it was seen that the data met the assumption of normal distribution. The correlation matrix showing the relationship between teachers' ability to use educational technologies and classroom management anxiety is given in Table 5.

Table 5. *Correlation matrix showing the relationship between levels of educational technologies use and classroom management anxiety*

Variables	A	A1	A2	A3	A4	B	B1	B2	B3
A. Levels of Educational Technology Usage	1								
A1. Technology Literacy	.954**	1							
A2. Technology Integration in Class	.883**	.770**	1						
A3. Social Ethics and Legal Provisions	.603**	.431**	.520**	1					
A4. Contact	.519**	.349**	.432**	.327**	1				
B. Classroom Management Anxiety	-.234**	-.293**	-.119	-.060	-.035	1			
B1. Communication Anxiety	-.193*	-.263**	-.072	.006	-.031	.853**	1		
B2. Motivational Anxiety	-.226**	-.287**	-.108	-.038	-.047	.954**	.813**	1	
B3. Time Management Anxiety	-.228**	-.275**	-.128	-.087	-.024	.971**	.744**	.873**	1

N=159; *p<.05; **p<.01

As shown in Table 5, there is a negative, significant, and weak relationship between teachers' levels of using educational technologies and classroom management anxiety (r=-.234, p<.01). According to teachers' opinions, the levels of using educational technologies and communication anxiety (r=-.193 p<.05), motivation anxiety (r=-.226, p<.01) and time management anxiety (r=-.228, p<. 01) were found to have a negative, significant, and weak relationship.

According to the teachers' views, technology literacy and communication anxiety (r=-.263, p<.01), motivation anxiety (r=-.287, p<.01), time management anxiety (r=.275, p<.01) were found to have a significant, negative, weak correlation.

Multiple regression analysis was conducted to determine to which extent teachers' use of educational technologies predicted classroom management anxiety. Before the analysis, the results of the analysis performed to determine whether the data met the assumption of normal distribution is shown in Table 2 and

it was seen that the data met the assumption of normal distribution. The results of the regression analysis are given in Table 6.

Table 6. *Regression analysis results in classroom management anxiety*

	B	Standard Error	β	t	p	Tol.	VIF
Constant	4.20	.579		7.25	.000		
Technology Literacy	-.557	.134	-.496	-4.162	.000	.406	2.46
Technology Integration in Class	.348	.187	.240	1.85	.065	.346	2.89
Social Ethics and Legal Provisions	.031	.139	.020	.220	.826	.715	1.39
Contact	.032	.096	.028	.333	.740	.799	1.52

R=.338 R^2=.114   Durbin-Watson=.805   F(4,154)=4.966   p=.001

As shown in Table 6, the sub-dimensions of teachers' level of use of educational technologies predict classroom management anxiety (r=.338, R^2 = .114, F(4, 154) = 4.966, p<. 05). With the relevant sub-dimensions, it was seen that they explained approximately 11% of the total variance of classroom management anxiety. It is seen that the order of importance of the predictive variables on classroom management anxiety is "Technology Literacy," "Technology Integration in Classes," "Communication" and "Social Ethics and Legal Provisions." Looking at the regression analysis, it is seen that technology literacy (t=-4.162, p=.000) has a significant and negative effect on classroom management anxiety.

Findings According to Demographic Characteristics of Teachers

The Manova test was conducted to determine whether the level of teachers' use of educational technologies and classroom management anxiety showed a significant difference according to their gender. It was seen that the Levene F test result (p>.05) performed before the Manova test provided the assumption of homogeneity of variances, and the Box M test (Box M =.512, p>.05) provided the necessary conditions for the assumption of equality of covariance matrices. The results of the Manova test are given in Table 7.

Table 7. *Analysis results according to gender*

Factors	Gender	N	x̄	S	sd	F	η^2	P
Levels of Educational Technology Usage	Female	103	3.58	.69	1–157	5.74	.035	.018
	Male	56	4.08	.82				
Classroom Management Anxiety	Female	103	4.09	1.07	1–157	6.27	.038	.013
	Male	56	3.64	1.13				

Wilks Lambda (λ)=.008, F(2–156)=4,95, p<.05

As shown in Table 7, there is a significant difference between teachers' levels of using educational technologies according to their gender and classroom management anxiety (Wilks Lambda (λ)=.008, F (2–156)=4.95, p<.05). Because of the test, it is seen that the level of educational technology use by male teachers is higher than that of female teachers. However, it is seen that female teachers' classroom management anxiety is higher than that of male teachers.

The assumptions of the test were tested before the Manova test, which was planned to determine whether the level of teachers' use of educational technologies and classroom management anxiety differed significantly according to the level of the school they graduated from. It was seen that the necessary conditions were met for the homogeneity of variance assumption because of the Levene F test (p>.05), and for the assumption of equality of covariance matrices because of the Box M test (Box M =.512, p>.05). Since the number of associate degree graduates is low, it was tested by grouping it with undergraduate graduates. The results of the Manova test are shown in Table 8.

Table 8. *Analysis results according to the graduation levels*

Factors	Educational Status	N	x̄	S	sd	F	η²	P
Levels of Educational Technology Usage	Associate / Bachelors Degree	135	3.62	.761	1–157	7.81	.047	.006
	Master's Degree	24	4.08	.615				
Classroom Management Anxiety	Associate / Bachelors Degree	135	3.97	1.09	1–157	.786	.005	.377
	Master's Degree	24	3.75	1.22				

Wilks Lambda (λ)=.022, F(2–156)=3.91, p<.05

As shown in Table 8, there is a significant difference between the level of teachers' use of educational technologies and their classroom management anxiety levels according to the school level they graduated from (Wilks Lambda (λ)=.022, F(2–156)=3.91, p<.05). Because of the test, it was understood that there was a significant difference between the levels of using educational technologies among those with a master's degree and those with a bachelor's/associate degree. We observed that the educational technology usage levels of those with a master's degree were higher.

Before the Manova test, which was planned, the assumptions of the test were examined to determine whether the level of teachers' use of educational technologies and classroom management anxiety showed a significant difference according to their age. It was seen that the necessary conditions were met for the assumption of homogeneity of variances because of Levene F test (p>.05), and for the assumption of equality of covariance matrices because of the Box M test (Box M =.735, p>.05). The results of the Manova test are given in Table 9.

Table 9. *Analysis results according to age*

Factors	Age	N	x̄	S	sd	F	η²	P
Levels of Educational Technology Usage	23–30	18	3.85	.66	3–155	4.75	.084	.003
	31–40	65	3.84	.64				
	41–50	49	3.68	.78				
	51–60	27	3.23	.85				
Classroom Management Anxiety	23–30	18	4.10	1.09	3–155	.951	.018	.418
	31–40	65	4.04	1.03				
	41–50	49	3.71	1.20				
	51–60	27	3.97	1.15				

Wilks Lambda (λ)=.006, F(6–308)=3.10, p<.05

As shown in Table 9, there is a significant difference between the level of teachers' use of educational technologies according to their age and their classroom management anxiety (Wilks Lambda (λ)=.006, F(6–308)=3.10, p<.05). The POST Hoc Test (Tukey) test was performed to examine which groups had significant differences., It was determined that there is a significant difference between the levels of using educational technologies between teachers aged 23 -30 and teachers aged 50–60, and between teachers aged 30–40 and teachers aged 50–60 because of the test. It has been observed that the teachers aged 23–30 and 30–40 have higher educational technology use levels than teachers aged 50–60.

The assumptions of the test were tested before the Manova test, which was planned to examine whether there was a significant difference between the level of teachers' use of educational technologies and the classroom management anxiety according to the type of school they work in.   It was seen that the necessary conditions were met for the assumption of homogeneity of variances because of Levene F test (p>.05), and for the assumption of equality of covariance matrices because of the Box M test (Box M =.761, p>.05). Since the number of teachers working in pre-school schools is low, it was tested by grouping together with the teachers working in the primary school. The results of the Manova test are shown in Table 10.

Table 10. *Analysis results according to school types*

Factors	School Type	N	$\bar{x}$	S	sd	F	η^2	P
Levels of Educational Technology Usage	Preschool/Primary School	29	3.72	.71				
	Secondary school	52	3.78	.74	2–156	.735	.009	.481
	High school	78	3.62	.78				
Classroom Management Anxiety	Preschool/Primary School	29	4.09	.96				
	Secondary school	52	3.86	1.19	2–156	.401	.005	.670
	High school	78	3.93	1.12				

Wilks Lambda (λ)=.684, F(4–310)=.571, p<.05

As shown in Table 10, there is no significant difference between the level of teachers' use of educational technologies and classroom management anxiety according to the type of school they work in (Wilks Lambda (λ)=.684, F(4–310)=.571, p<.05).

DISCUSSION and CONCLUSION

The results of the research demonstrated that teachers with higher educational technology use levels have higher classroom management skills and had lower classroom management concerns. Güneş and Buluç (2018) stated that the higher the level of technology use, the higher the classroom management skills will be. Varank and İlhan (2013) stated that teachers with a high perception of educational technology have higher classroom management skills. As a result, as teachers' educational technology use competencies increase, their classroom management concerns decrease.

It was concluded that educational technology use levels are a predictors of classroom management anxiety of the results of the analysis conducted to study educational technology use levels predict classroom management anxiety or not. That is, it is said that the level of educational technology use is effective in the classroom management anxiety of teachers who are one of the most crucial parts of education. Because of the analysis made according to gender in the research, it was seen that the level of using educational technologies of female teachers was lower than that of male teachers. Bolat, et al. (2020) state that male teachers' use of educational technology and the level of integration into the lesson are higher than that of female teachers. Summak et al. (2010) revealed in their study that male teachers are better at using technology than female teachers. These results agree with the results of this study. Güneş and Özerbaş (2015) state that there is no difference between the levels of female and male teachers using educational technologies and they use them equally. Çakır and Oktay (2013) found in their study that the technology use levels of female and male teachers are similar to each other. Aksoğan and Bulut Özek (2020) have defined that there is no significant difference according to gender in teacher candidates' using technology in education.

In the study, it is seen that female teachers' classroom management concerns are higher than those of male teachers. Gezen (2021) concluded that there was no significant difference between male teachers' classroom management anxiety levels and female teachers' classroom management anxiety levels. Sadık and Nasırcı (2019) state that female teachers have lower classroom management concerns than males. In this study, it is considered that classroom management concerns are high since most of the female teachers in the study group work at the high school level. Additionally, it can be said that classroom management concerns increase in connection with the low level of educational technology use.

When the study group is analyzed according to the age variable, it is seen that the teachers between the ages of 23–30 and 30–40 have higher educational technology use levels than the teachers between the ages of 50–60. It is thought that this situation is explained by the fact that young teachers start using technology at an earlier age and are more interested in technology. Horzum (2010) states that the use of technology is higher for teachers with low professional seniority. Kaya (2017) states in his study that young teachers use technology more in teaching processes. Admiral et al. (2017) stated that

60

as seniority increases, positive attitudes toward technology decrease. Bolat et al. (2020) stated that using the level of educational technologies of teachers with low seniority is higher than that of teachers with higher seniority. The results of this study comply with the results of our study. In contrast, studies have shown that the level of using computer and internet-based technologies does not make a significant difference according to the age variable (Durak & Seferoğlu, 2017; Ulaş & Ozan, 2010). As a result, as the age of the teachers increases, their educational technology usage level decreases.

In the study, it is seen that teachers' classroom management concerns do not differ according to the age variable. Yalçınkaya and Tonbul (2002) found that classroom management skills did not change according to seniority in their studies. Yılmaz and Aydın (2015) found that primary school teachers' classroom management skills do not differ according to age and seniority. Similarly, Güven and Cevher (2005) found that classroom management skills did not change according to the age variable. Dinçer and Akgün (2015) stated that teachers with more seniority have higher classroom management skills. As a result, it is seen that teachers do not experience classroom management anxiety as their seniority changes. Although older teachers have deficiencies in the use of educational technologies compared to that of younger ones, the reason why classroom management anxiety does not change according to their age may be thanks to their classroom management competence.

It is seen that the types of schools in which the teachers participate in the research work do not show a significant differ according to the scale of determining the level of use of educational technologies. Aktürk and Delen (2020) found in their study that primary and secondary school teachers' technology acceptance levels are higher than those of high school teachers. Ursavaş (2014) stated that primary school teachers' information technology usage skills differ compared with secondary and high school teachers.

It was found that the classroom management anxiety levels of the teachers participating in the study did not differ according to the type of school and the educational status of the teachers. Sadık and Nasırcı (2019) found that high school teachers' classroom management anxiety levels were generally low. Ozgan et al. (2010) and Bayrakçı and Sarı (2018) found in their studies that teachers' classroom management skills did not differ according to their educational status.

In the analysis conducted according to the educational status of the teachers in the research, it was concluded that the level of educational technology use by postgraduate teachers was higher than that of undergraduate and associate degree graduates. Durak and Seferoğlu (2017) stated that postgraduate teachers are more competent in using technology. Usluel et al. (2007) in his study with classroom and branch teachers stated that the use of information technologies in the learning-teaching process resulted in favor of those who received postgraduate education according to the education level of the teachers. This situation can be explained by the fact that teachers who are self-developing and open to innovation constantly improve themselves in terms of technology use competence.

RECOMMENDATIONS

Young teachers with high proficiency in technology use and senior teachers can cooperate on the use of educational technologies. It can be ensured that teachers' classroom management concerns can be reduced by making studies to improve the use of educational technologies, especially by female teachers.

Although classroom management anxiety is so important that it can affect every stage of education, there are very few studies in the literature on reducing this anxiety and finding its causes. Both quantitative and qualitative studies can be conducted in this area. Studies on this subject will help increase the efficiency of education.

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Program Proposals of Pre-Service Teachers for the Lifelong Learning Needs of the Society

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Article Info	ABSTRACT
	The purpose of this study is to present lifelong learning program proposals based on an event or phenomenon that pre-service teachers have experienced. The research is a qualitative study and phenomenology was determined as the research design. The study group consists of 62 pre-service teachers studying at the education faculty of a state university. Criterion sampling method was adopted. 4 demographic (gender, age, department and grade level) questions were asked in order to obtain the program proposals of the pre-service teachers for the lifelong learning needs of the society and the participants were asked to make a lifelong learning program proposal by describing the event or phenomenon they experienced. The data obtained were collected online in the 2020-2021 academic year. The analyzes were carried out by the researchers. Frequency analysis was done for the lifelong learning programs proposed by the participants and the lifelong learning programs recommended by the participants and the experienced events or phenomena were coded by content analysis. It was seen that computer course (N=7) and farming education (N=7) come to the fore among the lifelong learning programs proposed by the participants. It was determined that the lifelong learning programs proposed by the participants were related to profession, technology, personal development, health and environment, handicrafts, education, law, art and sports. Based on the findings, it can be said that the need for lifelong learning is closely related to the conditions of the society and the environment in which they live.

INTRODUCTION

Beginning in the late 1980s, the term of lifelong learning has become a central principle of European education policy (Stromquist, & Da Costa, 2017). Although the concept of lifelong learning has been universally accepted, the debates about its evolution and the forms it emerged in the early 20th century continue to attract great attention (Owusu-Agyeman, 2017). More recently, both economists and business leaders thought that vocational training, instead of lifelong learning, would provide a greater return on investment (Roche, 2017). Today, within the scope of the European Union (EU), there are some issues such as expression of social and economic problems as a result of demographic changes, increasing economic global competition and the pressure created by migration. These factors have led policy makers to emphasize vocational and market-driven adult education and lifelong learning (Stromquist, & Da Costa, 2017). In addition, lifelong education and/or learning has played a very important role in agreements between states, international and supranational organizations (Lima, & Guimarães, 2011a).

According to lifelong learning, people learn not only in schools and universities, but also in common and informal menses throughout their lives (Steffens, 2015). According to another definition, it means the learning which starts in the cradle and goes beyond the grave (Biao, 2015). The European Commission (2001) defines lifelong learning as *all learning activities experienced throughout life to increase knowledge, to develop skills and to obtain competence from a personal, civic, social and/or employment-related perspective* (Steffens, 2015).

It can be stated that lifelong learning is a learning that covers informal, non-formal and formal education areas (Biao, 2015; Owusu-Agyeman, 2017). However, it should be added that lifelong learning is much more than retraining or on-the-job training: it is a response to students' demands for "tailor-made" and even personalized education (van der Zwaan, 2017). In line with all definitions, there is not an accepted definition of lifelong learning and the term is interpreted as raising a workforce that can adapt to the rapidly changing world in the Age of Learning (Sharples, 2000). As a matter of fact, the emerging paradigm change from "learning" to "lifelong learning" is overwhelmingly suggested as a necessary response to the information explosion situation in current times of change (Su, 2015).

Looking at its definition, lifelong learning; it covers the entire field of education, including basic education, basic continuing education and continuing education at the university (Dinevski, & Dinevski, 2004). Indeed, lifelong learning can be broadly compared; it takes the ever-present dimensions of learning such as adult learning, non-formal and informal learning and offers conceptual space for many new learning modes emerging in the Information Age (Roche, 2016). In addition to its informal aspect, lifelong learning also has aspects of non-formal education (planned but flexible) and formal education (planned but with strict measures) (Biao, 2015). In addition, the boundaries between formal and non-formal learning should be removed or at least made more permeable to facilitate the transition from education systems to lifelong learning systems and ultimately to the learning society (Roche, 2017).

Some articles, books, preliminary articles and policy reports have been written and still being written on lifelong learning. The number of lifelong learning models defined by different scientists varies according to the perspective they have to look at the phenomena and the criteria for distinguishing different education and learning concepts (Regmi, 2015). From this point of view, it can be underlined that lifelong learning is a very general concept. It applies to all learning activities that individuals participate in throughout their lives, in formal (school and university), non-formal education settings (other forms of institutionalized learning) or informal settings (at home, with peers' family members). Therefore, it seems impossible to choose a learning theory that can explain all forms of lifelong learning. However, recently, new theories that may have an impact on the understanding of lifelong learning have been suggested (Steffens, 2015).

In general, it can be stated that the goal of lifelong learning is on learning at different life stages (Tucket, 2013). In this context, for many people, lifelong learning can be seen as a goal in itself, a very important basis for an individual's personal satisfaction. Lifelong learning appears to be necessary to find, maintain and thrive in a job. It also contributes to employees' coping with unemployment and early retirement, and accessing and re-accessing job opportunities (Charungkaittikul, & Henschke, 2014). In this context, the shift of human consciousness and discourse from "learning" to "lifelong learning" means a change in the basic nature of learning (Su, 2015).

Lifelong learning may have an important protective affect by keeping adults close to the changing labor market and potentially provide a way out of poor labor market experience (Evans, Schoon, & Weale, 2013). In addition, lifelong learning can play an important role in reducing widespread tensions between economic competitiveness policies and social cohesion policies (Green, 2011). In the 21st century, global demands for economic competitiveness and social cohesion, the application of information technologies for interactive communication and related learning, and a growing awareness of the need for lifelong learning strategies come together to ensure sustainable economic and societal development (Charungkaittikul, & Henschke, 2014). For lifelong learning to contribute to global goals, there needs to be a strong re-emphasis on the role that education can play in raising informed and active citizens who can address all the social, economic and ecological changes they face (Tucket, 2013).

The modern use of lifelong learning seems to have become a global trend, demonstrating the need for learners of all ages to continue education and learning (Su, 2015). Indeed, the lifelong learning approach has gained currency through attempts to use it as a way to provide people with the knowledge and skills they need to succeed in a rapidly changing world (Sharples, 2000). At the same time, many education providers still advocate education and the concept of lifelong learning as providing access to self-actualization and a fun social life (Stromquist, & Da Costa, 2017). It is argued that lifelong learning is good at the stages of a learning life that interacts for the benefit of each, clearly being the catalyst for achieving other positive social achievements (Tucket, 2013). It is also worrying that a quarter of the adult population still misses out on the enjoyment and success of lifelong learning (Fryer, & Barber, 2000).

Lifelong learning systems in liberal countries is thought to produce highly unequal skill outcomes which tend to strengthen income inequality and damage social cohesion (Green, 2011). In this sense, it is thought that lifelong learning will not basically redefine life trajectories for the majority of its participants (Evans, Schoon, & Weale, 2013). However, in many places, lifelong learning policies are increasingly utilitarian (Tucket, 2013). People can benefit from lifelong learning since being talented and competent refers to having better jobs and more incomes (Regmi, 2015). Moreover, lifelong learning makes it possible to renew one's knowledge and catch up with the latest developments in all areas of human endeavors and life (Biao, 2015). Lifelong learning should play a key role in ensuring sustainability strategies that involve the active participation of affected people. In this regard, it is important to help shape the changing economic and social conditions necessary to ensure sustainability for all in a climate-changing society. In addition, measuring this participation should be an element of the goal (Tucket, 2013).

The basic assumption of Fischer and Konomi (2007)'s approach to lifelong learning is as follows: if the world of work and life is based on collaboration, creativity, framing problems, dealing with uncertainty, change and distributed cognition, then education needs to prepare students for meaningful and productive lives in such a world. In addition, the main premise of lifelong learning is that it is not possible to equip students at school, college or university with all the knowledge and skills they need to develop throughout their lives (Sharples, 2000). In this context, the term lifelong learning should be taken literally, no longer just as something that corrects early-onset academic failure after school, but as a journey in which the years of compulsory education play an important role (Breslin, 2016). In addition, increasingly, education administrators, head teachers, teachers and some school administrators

are realizing that lifelong learning interests them, but there is still a long way to go (Fryer, & Barber, 2000). In this sense, education, as a profession, necessitates to establish deep relations with stakeholders (Saltalı-Durmuşoğlu, 2021).

From a humanistic perspective, lifelong learning should develop individuals' knowledge and skills in an environment that supports individual freedom, autonomy, participatory practices and trust (Owusu-Agyeman, 2017). In addition, lifelong learning is based on a strong criticism of the school and the fact that for over three decades the education systems of many countries have failed to meet people's expectations for upward social mobility (Lima, & Guimarães, 2011b). However, when the phenomenon of lifelong learning is examined more in current times of change, it seems important that it is not simply understood as equivalent to the continuity of learning for learners of all ages (Su, 2015). Within the context of this study, it was aimed to present lifelong learning program proposals based on an event or phenomenon that pre-service teachers have experienced. For this purpose, the research question below is addressed.

1. What are the lifelong learning programs proposed by pre-service teachers based on their experiences?

METHOD

In this section, the research design, study group, data collection tool, data collection, data analysis and validity and reliability are presented below under separate subheadings.

Research Design

The research is a qualitative study and phenomenology, one of the qualitative research designs, was determined as the research design. Phenomenology was used to uncover the nature of a phenomenon by discovering it from the perspective of individuals who experienced it in order to find out the meaning of the phenomenon (Teherani et al., 2015). In this context, pre-service teachers were asked to describe an event or phenomenon they experienced and propose a lifelong learning program (for example, farming education) based on this event or phenomenon. The most important purpose here is to enable pre-service teachers to observe the environment they live in and be aware of the learning needs of the society.

Study Group

The study group of this research, which aims to obtain program recommendations from pre-service teachers for the lifelong learning needs of the society, consists of 62 pre-service teachers studying at the education faculty of a state university. Criterion sampling method (Patton, 2002), one of the purposeful sampling types, was adopted in the formation of the study group, and being taken or having been taken the "Adult Education and Lifelong Learning" course as an elective course was determined as a criterion.

When the demographic information of pre-service teachers is examined; in terms of gender, 41 (66.13%) were female and 21 (33.87%) were male; in terms of age, 15 (24.2%) were 20 years old, 18 (29.03%) were 21 years old, 10 (16.13%) were 22 years old, 3 (4.84%) were 23 years old, 2 (3.23%) were 24 years old and 14 (22.58%) were aged 25 and over; in terms of department, 21 (33.87%) preschool education students, 14 (22.58%) social studies education students, 14 (22.58%) guidance and psychological counseling students, 7 (% 11.29) Turkish education students, 5 (8.06%) classroom education students and 1 (1.61%) science education student; in terms of grade level, 8 (12.9%) are 2nd year students and 54 (87.1%) are 3rd year students.

Research Instruments and Processes

4 demographic (gender, age, department and grade level) questions were asked in order to obtain the program recommendations of the pre-service teachers for the lifelong learning needs of the society

and the participants were asked to make a lifelong learning program proposal by describing the event or phenomenon they experienced. The main purpose of getting program proposals from the participants and asking them to talk about the event or phenomenon is to enable pre-service teachers to discover their environment and the lifelong learning needs of the society they live in. In the data collection tool, an answer was sought for the following statement: Tell an event or phenomenon that you have experienced and suggest a lifelong learning program (for example, farming education) based on this event or phenomenon.

In order to obtain data within the scope of the research, an application was made to the Scientific Research and Publication Ethics Committee of Muş Alparslan University, and the research was evaluated in terms of ethical principles with the decision number 8 taken at the meeting number 2 dated January 14, 2021. The data obtained were collected online in the 2020-2021 academic year, both in the fall and spring terms, through the Google Forms application due to the pandemic process.

Data Analysis

The answers entered in Google Forms by the participants were transferred to the word processing program by the researcher, and the necessary arrangements were made by examining them in terms of spelling. The analyzes were carried out by the researchers using NVIVO. The lifelong learning programs proposed by the participants were subjected to frequency analysis, and the lifelong learning programs suggested by the participants and the experienced (seen or lived) events or phenomena were coded by content analysis, the program names written by the participants were used as direct codes in some cases, and the thematic process was carried out. As part of the privacy of the participants, each participant was given an abbreviation and code number instead of a code name. E.g; KG5: Fall semester participant number 5, KB10: Spring semester participant number 10…

Validity and Realibility

In order to ensure the validity of the data obtained from the study, the "thick description" (Guba, & Lincoln, 1982) method was chosen. In other words, the statements of the participants were presented directly, without adding comments in the findings section. After the coding and thematic process, the answers given by the pre-service teachers and the codes given by the researcher to these answers were sent to a faculty member (assistant professor) who teaches the "Adult Education and Lifelong Learning" course. In this context, the reliability formula that Miles and Huberman (1994) brought to the literature was used to calculate the inter-coder reliability of the research: Reliability = Consensus / (Agreement + Disagreement). While consensus was reached in 65 of 72 codes between the other coder and the researcher, disagreement emerged in 7 of them. When the calculation was made according to the relevant formula, the reliability of the research was found to be 90%. If the reliability calculation exceeds 70%, it is considered that the research is reliable (Miles & Huberman, 1994).

FINDINGS

The data were obtained from 62 pre-service teachers studying in the departments of Turkish Education, Preschool Education and Classroom Education in the fall semester of the 2020-2021 academic year, and in the departments of Science Education, Social Studies Education, Guidance and Psychological Counseling Departments in the spring semester of the 2020-2021 academic year. When the data are analyzed, it is seen that in total, 20 pre-service teachers proposed a lifelong learning program that takes the needs of the society into consideration, but they did not make any explanations and mention about any event or phenomenon. On the other hand, it was seen that 42 pre-service teachers made statements and mentioned about an event or phenomenon in addition to proposing a lifelong learning program that takes the needs of the society into consideration. The lifelong learning program proposals of the 62 pre-service teachers, the number of proposals (N) and the codes obtained related to the participants' proposals are presented in Table 1 below.

Table 1. *Lifelong learning programs proposed by the participants*

Proposed Program	N	Participant Codes
Computer course	7	KG4, KG9, KG12, KB1, KB4, KB13, KB22
Farming training	7	KG2, KG13, KB1, KB3, KB5, KB10, KB18
Sewing embroidery course	4	KG3, KG7, KG31, KB1
Technology education	3	KG5, KG12, KB6
Foreign language education	3	KG16, KG33, KB16
Literacy course	3	KG32, KB1, KB15
Parent education	3	KB3, KB20, KB24
Beekeeping education	3	KB5, KB26, KB28
Health education	2	KG1, KB17
Hygiene education	2	KG6, KG10
Diction training	2	KG8, KG24
Animal husbandry training	2	KG18, KB10
Human rights education	2	KG22, KB14
Childcare education	2	KG29, KB19
Hairdressing course	1	KG7
Instrument course	1	KG9
Disaster education	1	KG11
Business training	1	KG14
Defense training	1	KG15
Entrepreneurship education	1	KG17
Occupational health and safety training	1	KG19
Risk analysis training	1	KG20
Recycling education	1	KG21
Combating Violence training	1	KG23
Distance education course	1	KG25
Time management education	1	KG26
Heating fire course	1	KG27
Carpet weaving course	1	KG28
Bakery products training	1	KG30
Motivation education	1	KB2
Activity-oriented courses	1	KB2
Quran course	1	KB7
Environmental education	1	KB8
Textile production, sales and machine training	1	KB9
Traditional shoes training	1	KB11
Communication education	1	KB12
Vocational training	1	KB21
Tulip breeding training	1	KB23
Barbering course	1	KB25
Furniture education	1	KB27
Tailoring training	1	KB29

When Table 1 was examined, it was seen that 62 pre-service teachers proposed 72 lifelong learning programs, but 41 of the 72 lifelong learning programs differed. It can be stated that the reason for 72 program proposals out of 62 pre-service teachers was that the same participants made more than one program proposal.

The findings showed that computer course (N=7) and farming education (N=7) come to the fore among the lifelong learning programs proposed by the participants. The other programs proposed by the participants were as follows: Sewing embroidery course (n=4), technology education (n=3), foreign language education (n=3), literacy course (n=3), parent education (n=3), beekeeping education (n=3), health education (n=2), hygiene education (n=2), diction training (n=2), animal husbandry training (n=2), human rights education (n=2), childcare education (n=2). Each of the other lifelong programs was proposed by one participant.

The fact that the computer course comes to the fore is closely related to the current pandemic process. Farming training is another lifelong learning program that is mostly proposed, which is thought

to be caused by the fact that the geography where the data were collected is mainly based on agriculture.

In Table 2, the lifelong learning programs proposed by 62 pre-service teachers are grouped under themes in line with the explanations and comments of the participants.

Table 2. *Themes created for the proposed lifelong learning programs*

Theme	Proposed LLL Program (Code)	n
Profession	Farming training, beekeeping education, animal husbandry training, hairdressing course, business training, heating fire course, bakery products training, Quran course, textile production, sales and machine training, vocational training, tulip breeding training, barbering course, furniture education, tailoring training	23
Technology	Computer course, technology education, distance education course	11
Personal Growth	Parent education, diction training, entrepreneurship education, risk analysis training, time management education, motivation education, communication education	10
Health and Environment	Health education, hygiene education, childcare education, disaster education, occupational health and safety education, recycling education, environmental education	10
Handicrafts	Sewing embroidery course, carpet weaving course, traditional shoes course	6
Education	Foreign language education, literacy course	6
Law	Human rights education, combating violence training	3
Art and Sport	Instrument course, defense training, activity-oriented courses	3

As can be seen in Table 2, the lifelong learning program proposals (code) of 62 pre-service teachers that takes the needs of the society into consideration, and the experiences mentioned by the pre-service teachers are classified under eight themes as profession, technology, personal growth, health and environment, handicrafts, education, law, and art and sports.

When the lifelong learning programs proposed by the participants were examined, it was noteworthy that most of the participants (n=23) put forward the program (code) related to the profession theme, which was followed by technology (n=11), personal growth (n=10), health and environment (n=10), handicrafts (n=6), education (n=6), law (n=3) and art and sports (n=3) themes.

Regarding the mentioned themes, the striking comments, explanations and experiences of the pre-service teachers were examined separately by giving direct participant quotations.

1st Theme: Profession
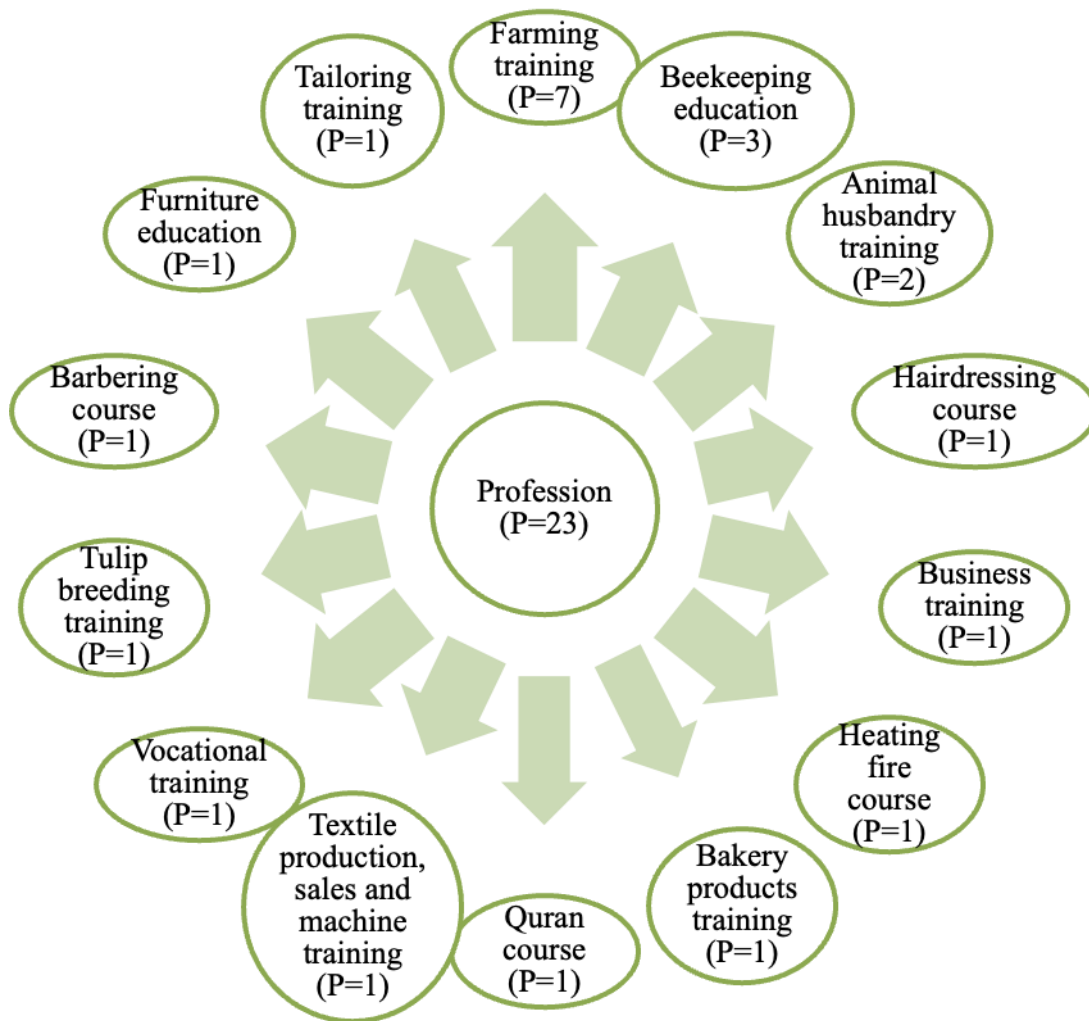
Figure 1. *Lifelong learning program proposal in the context of profession theme*

The findings showed that farming training, beekeeping education, animal husbandry training, hairdressing course, business training, heating fire course, bakery products training, Quran course, textile production, sales and machine training, vocational training, tulip breeding training, barbering course, furniture education, and tailoring training codes were obtained under the theme of *profession*, and 23 participants expressed their opinions related to the mentioned codes. Some of the statements of the participants are as follows:

"Unfortunately, women in our community are not in the position they deserve. For example, I saw a woman who wanted to work, but her husband did not allow her to work with the logic that she is a woman and women should stay at home. For this, I think that hairdressing courses and sewing and embroidery courses should be widely active for women." (KG7-Hairdressing course)

"One of the livelihoods in the villages is animal husbandry. For this reason, one of our biggest occupations is animal husbandry. For this, we constantly get some information from people who have strong knowledge about sheep and animal husbandry, and we gain knowledge and skills by applying this information." (KG18-Animal husbandry training)

"I work in the bakery products industry. Most masters, journeymen and apprentices trained in this sector are incompetent. They do their job, but by heart. In case of any mishap, most of them do not have an idea about the source of this mishap, so a lifelong learning area can be opened as bakery products training." (KG30-Bakery products training)

"We are providing Quran course. When we give Quran education to people, they pray constantly. There were adults who felt bad about not being able to learn about their religion as Muslims." (KB7-Quran course)

"Traditional agriculture and animal husbandry are practiced in our region. Our society has great shortcomings in this regard. We either do not know the income to be obtained with modern methods or we do not know how to do it, if applied training is given, the society will have experiences by living and will be more sensitive in this regard. (KB10-Farming training)

"I live in the province of Muş. Muş is known for its tulips, but we come across very few tulips. I think this is due to the fact that many people have no knowledge of tulip cultivation. By starting a tulip breeding course, both continuity is ensured and new job opportunities are created." (KB23-Tulip breeding training)

"Especially needs-oriented training should be given. I think beekeeping education is important, because it is done unconsciously. So, both the efficiency is low and many hive bees can die meaninglessly at once. The care of this sensitive animal species requires different and serious efforts. For example, I bought a hive of bees in one spring, and these bees became eight hives by the method of reproduction called as swarming. In this process, I was doing beekeeping with what I learned from different internet resources from the virtual world. But when it was autumn, I obtained much less honey than a beehive should yield. When it was winter, only one hive was left out of eight bees, and all the remaining bees had died because in winter they had to stay at a certain temperature, while at the same time there had to be as little noise as possible for them to hibernate. Of course, I learned this later. I learned a lot of similar things. As I mentioned before, it requires very different efforts, so these problems can be eliminated with lifelong learning." (KB26-Beekeeping training)

When the statements of the participants in the context of *profession* theme were examined, it was seen that participants mentioned about some courses such as farming training, beekeeping education, animal husbandry training, hairdressing course, business training, heating fire course, bakery products training, Quran course, textile production, sales and machine training. They were in the opinion that there should be courses for every segment of society and that individuals living in the society need courses for their personal developments. It can be concluded from these statements that the needs for courses were shaped based on the living conditions of the society.

2ⁿᵈ Theme: Technology
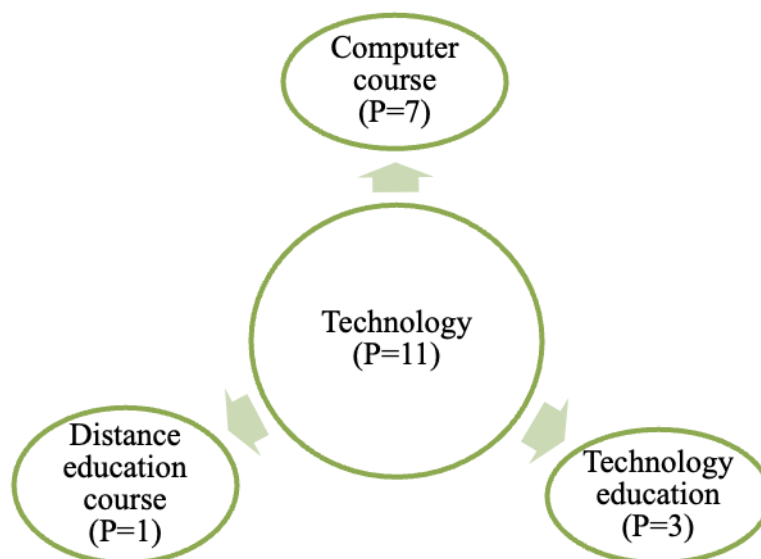
Figure 2. *Lifelong learning program proposal in the context of technology theme*

The second theme that emerged in the study was *technology*, and under this theme computer course,

technology education and distance education course codes were obtained. 11 participants stated their opinions about these codes as follows:

"How should technology be used? There may be a training program for this. We are in the 21ˢᵗ century. We say that we are in the age of information, informatics and technology. Unfortunately, there are wrong uses of technology as well as its correct use. Especially families are unaware of this issue. The unconsciousness of the family causes the child or young person to be ignorant and unconscious about this issue. Not only young people, but also adults spend most of their time on social media, such as Instagram and TikTok, which is useless and only waste time. If people read books instead of spending their time on such things, they will both improve themselves and set a good example for the next generation. To give an example from my close circle, although my uncle's son is very young, he has a slip in one eye because he is constantly given the phone and other technological devices. As the reason, it is shown that he deals with excessive technological tools and is involved with them. For this reason, such a training program can be established both in Muş and in other cities of the country and even in the world. By creating such a course, education can be given to families first, and then to young people, about what technology is and how it should be used. Awareness can be created in the society on this issue." (KG5- Technology education)

"I haven't experienced it, but I think "computer management course" or "computer course" has become a necessity of this century. I also think that instrument courses such as guitar, baglama or drums courses are also necessary as a therapy of brisk life, both in terms of health and personal development." (KG9-Computer course)

"I think a distance education lifelong learning program should be given to parents. In today's conditions, the problem of this is obvious. Now it is clear that distance education will become a part of life." (KG25-Distance education course)

"Due to the technological problems I experienced during the distance education process, I had a hard time at first because I did not have sufficient technology usage skills. Therefore, being able to attend a computer course can help me with my situation in this process." (KB4-Computer course)

"As of today, I propose the computer education program as lifelong learning as a result of the development of technology and the use of information networks in many places, including government institutions, and the request for appropriate documents and documents." (KB13-Computer course)

When the participants' opinions under *technology* theme were evaluated, it was seen that participants mentioned about some issues about technology. For example, they stated that the 21ˢᵗ century is the age of information and technology, technology could be used incorrectly, families had wrong information about technology use, they raised their children incorrectly in this regard, children and adults wasted time on social media and technology and it was important to raise awareness about the correct use of technology. It can also be said that participants mentioned about the importance of acquiring computer skills, the current age revealed that acquiring computer skills was a necessity and it was a necessity to acquire these skills, distance education processes had become a part of life, computer skills were an important necessity in distance education processes due to the advancement of technology and the widespread use of information networks in government institutions.

3ʳᵈ Theme: Personal Growth
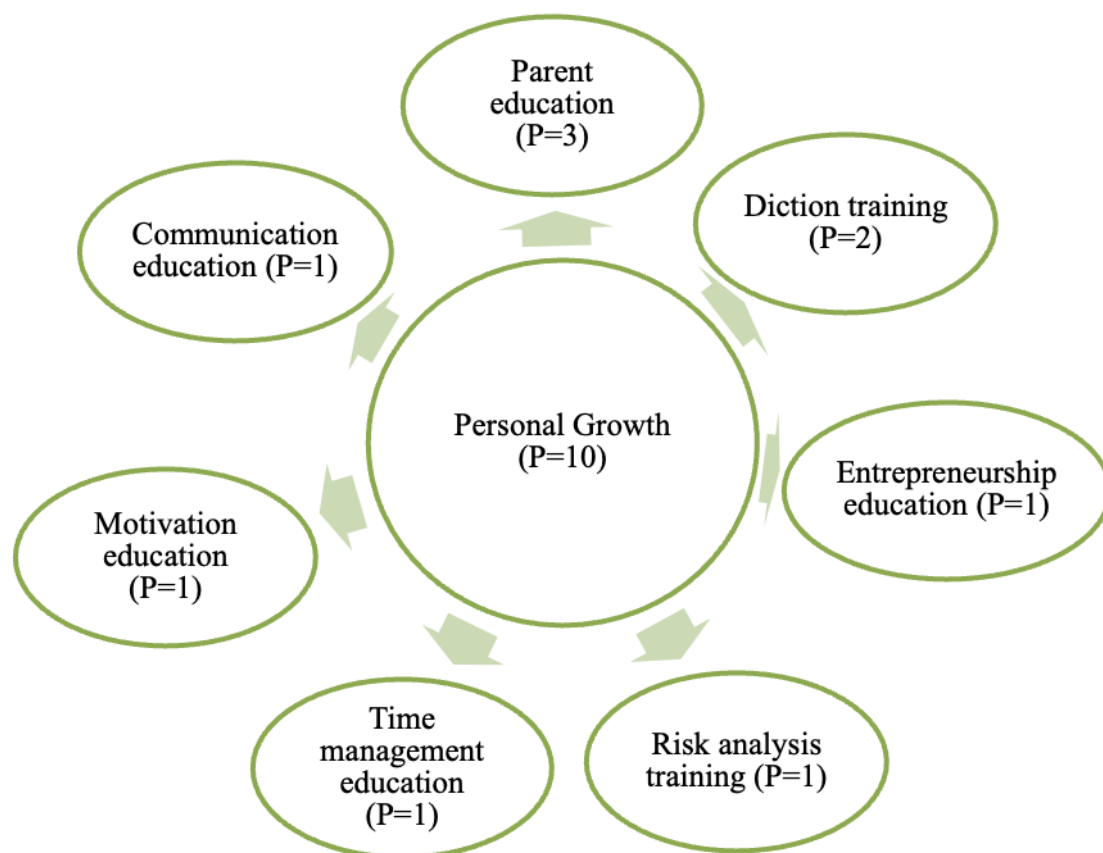
Figure 3. *Lifelong learning program proposal in the context of personal growth theme*

Under the theme of *personal growth*, another theme, parent education, diction training, entrepreneurship education, risk analysis training, time management education, motivation education and communication education codes were obtained, and 10 participants expressed their opinions on the mentioned codes. Some of the statements of the participants are as follows:

"Diction training: Since there are different races and ethnic groups in my geography, every child first learns their mother tongue. Therefore, this education is an important need due to the inaccuracies in the pronunciation and swallowing of words while speaking Turkish, which is the official mother tongue of Turkey. In order to meet this need, various courses and departments should be opened." (KG24-Diction training)

"Activity courses for housewives, motivation education due to the difficult pandemic process that we are in…" (KB2-Motivation training)

"*In my opinion, parent education should also be given, because there are too many couples in our country who do not have knowledge about raising children." (KB3-Parent education)*

"There is no such thing as patience in the environment I live in, people have no tolerance for each other, and communication education will be very good." (KB12-Communication training)

"I think that families are very inadequate in raising children in the neighborhood I live in. Most parents try to raise their children according to traditional methods, and they ignore the developmental characteristics of the child. For this reason, I consider that parent education program is necessary." (KB20-Parent education)

"There is a complaint that we hear all the time in life: Where is this youth going? Generation is

getting worse. I remember from an article I read: There is such a site in one of the old inscriptions. The first people who can educate the generation are the parents. If the parents are conscious, the probability of the generation being conscious increases even more. I think the most important part we need to educate is parents. Today, we see that children who are brought up in a disinterested and unconscious way, unfortunately, do not become good individuals. For this, we have to educate people, parents." (KB24-Parent education)

The participants who expressed their opinions within the scope of the theme of *personal growth* stated that there were problems such as pronunciation and word swallowing when speaking the official mother tongue since the geography contained different ethnic elements, the motivation of housewives for life should increase due to the pandemic process, married couples had important deficiencies in the context of raising children, individuals in the society had problems with each other. They also underlined that parents living in the region they worked in had no tolerance for their children, many families raised their children with traditional methods and did not care about their children's developmental characteristics, and therefore families should be educated in order for children to grow up as good individuals. Lastly, they emphasized that families were in the key position for raising their children in a good way.

4th Theme: Health and Environment
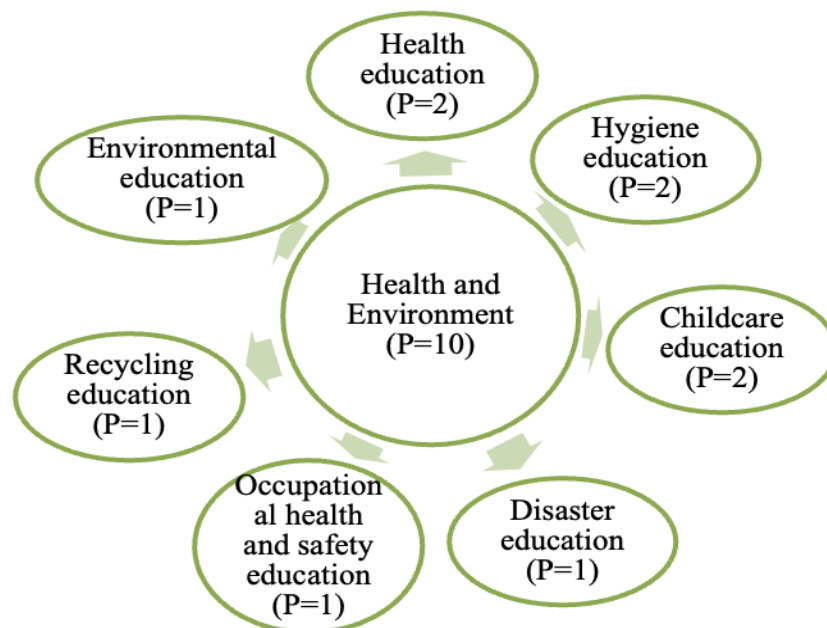
Figure 4. *Lifelong learning program proposal in the context of health and environment theme*

Health education, hygiene education, childcare education, disaster education, occupational health and safety education, recycling education and environmental education codes are included under *health and environment* theme, and 10 participants shared their views on the mentioned codes. Some of the opinions of the participants are as follows:

"There are many people who do not take into account the serious health problems we experience and ignore them. The majority of people persistently breaks the rules and behaves insensitively, even while walking on the streets, in the markets, at the cash registers. Personally, I encounter this problem mostly while waiting in line at the market. I can even hear the breathing of the person behind me as I wait to pay for what I bought. I pull back a little, but the same thing continues. I get weird reactions when I warn them. It's offensive to be warned by everyone for the same valid rules, but that's not what people care about, unfortunately. In order to clarify such problems and to provide solidarity and support among people, information programs should be organized about the problem in question." (KG1- Health education)

"It is a situation I have experienced myself: When I was a paid teacher, parents would always come to me and ask about their children's course status. Most of the parents were parents who did not pay attention to their personal care. When I saw those neglected teeth, my only goal was to send those parents in haste without vomiting. As such, I could not give detailed information about their children. For this reason, "hygiene education" should be given in order to add another topic to lifelong learning within the framework of personal care in order to ensure that people are accepted and socialized in the society. (KG10-Hygiene education)

"It is a disaster education program because I have encountered earthquakes in many places so far, and the people around me do not know what to do, so they are very scared, rushed and confused, and this may cost their lives, maybe not that day, but another time." (KG11-Disaster education)

"Occupational health and safety because I can say that some workers work in very bad conditions and have problems in terms of occupational safety. Especially during this pandemic process, I see that some textile workers that I see around me have to work despite everything and that the places they work do not take into account adequate precautions and warnings in terms of health. Employers and workers need to be made aware of these and similar events." (KG19-Occupational health and safety education)

"Recycling education: The reason why I propose this is because it is a subject that should be educated not only in our country but also in the whole world. The reason is that people brought the end of the world. Mistakes made because of ignorance. With training, these mistakes can be corrected. In this way, we will leave a clean world to future generations. There is nothing that cannot be solved with education." (KG21-Recycling education)

"I think that environmental education is an education that people need in general. People are quite unconscious about the damage they cause to the environment and they do not accept this unconsciousness. For this reason, an education should be given in order to raise awareness of people about the environment." (KB8-Environmental education)

"First aid, health services course, because nowadays health has become very important. Many people lack health information. Every segment, young or old, should have enough knowledge to protect themselves. Thanks to these health courses, awareness can be created in citizens." (KB17-Health education)

When the statements of the participants in the context of *health and environment* theme were examined, it was seen that participants mentioned about some issues related to health and environment. They were in the opinion that individuals did not care much about the health issue and they had incomplete information on this issue, the parents of the students did not pay enough attention to the hygiene rules, the individuals did not know how to act in the face of disasters and they were afraid in case of disasters, the workers had bad working conditions, there were serious problems in terms of occupational health and safety and employers did not care about these problems, it was important to leave a clean world to future generations, and recycling education was a point that concerned not only our country but the whole world, individuals were not sensitive to the environment, people acted unconsciously and it was necessary to raise awareness in the context of health in individuals.

5th Theme: Handicrafts
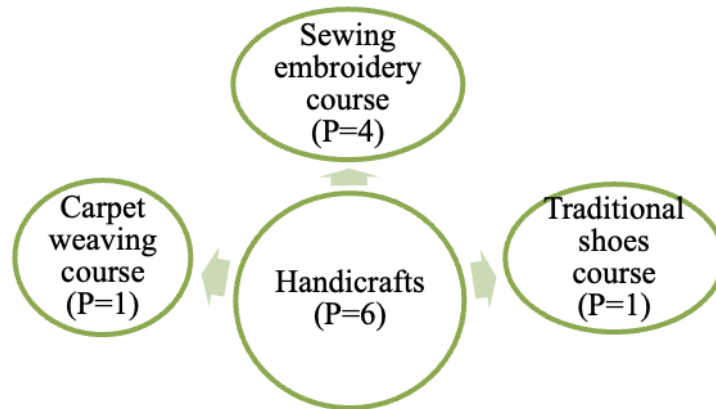
Figure 5. *Lifelong learning program proposal in the context of handicrafts theme*

The fifth theme emerged as *handicrafts* and under this theme, sewing embroidery course, carpet weaving course and traditional shoes course were included. 6 pre-service teachers stated their opinions on this theme. Some of their statements are as follows:

"To give an example from my environment, our neighbor started a new business after going to a sewing and embroidery course and receiving training. After starting this business, she tried to encourage all women in the neighborhood to take a sewing and embroidery course. She taught them sewing embroidery processes and techniques at work. These women, who learned how to sew bed linens and sew fabrics together, gained economic power in their lives and managed to stand on their own feet with sewing and embroidery courses." (KG3-Sewing embroidery course)

"Unfortunately, women in our community are not in the position they deserve. For example, I saw a woman who wanted to work, but her husband did not allow her to work with the logic that the women should stays at home. For this, I think that hairdressing courses and sewing and embroidery courses should be widely active for women." (KG7-Sewing embroidery course)

"Because I reside in the province of Bitlis, I believe that the continuation of the traditional shoe craft, which is in its last days, should be ensured and such a deep-rooted legacy should be left to future generations. As a matter of fact, there is only one master who continues this branch of craft today. That's why this course needs to be given under the name of lifelong learning urgently." (KB11-Traditional shoes course)

Some participants, who proposed a lifelong learning program within the scope of *handicrafts* theme, stated that his/her neighbor, who went to the sewing and embroidery course, started a business, and further directed the women around her to this course, and that the women became economically stronger after participating in the sewing and embroidery course. Additionally, the other participants mentioned that women were not valued enough in the society, in some cases husbands opposed the participation of wives in working life, therefore they supported the sewing and embroidery course, and that it was an important need to carry the traditional shoes craft that was in danger of being forgotten to the future.

6th Theme: Education
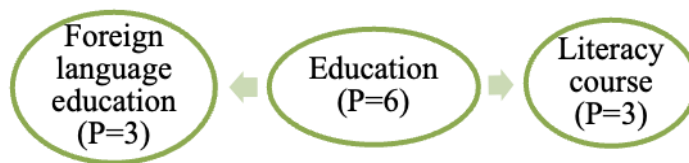
Figure 6. *Lifelong learning program proposal in the context of education theme*

Under the theme of *education*, which is another theme, there are foreign language education and literacy course codes, and 6 participants expressed their opinions regarding the mentioned codes.

"My teacher, the effects of social life affect the place and people, so my teacher, we deal with agriculture, animal husbandry and trade in our region. Our President contributes to this issue, so I can say that the library, school, public education center are important in this regard. In other words, elderly, adults and some young people have difficulties in banks, hospitals or any other places, so they get sick, they can't get an appointment, they need money but they can't withdraw money from the bank. I have witnessed many incidents, so sometimes even if they are right in normal situations, they cannot make their defense because they do not know how to read or write or they do not know Turkish language, so I can say that language education and literacy are important in order to eliminate such negativities. In other words, I can say that courses, training programs and language training are important in order to prevent and eliminate these negativities." (KB15-Literacy course)

"Foreign language courses can be opened apart from formal education. In formal education, more grammar-based education is given. That's why, in the touristic places I go around, when our people are asked questions, they say they don't know and run away. There's nothing to talk about. Unfortunately, this is actually quite frustrating. In my opinion, it is very important to give foreign language courses in non-formal education with the focus of speaking and practicality in addition to grammar. The number of language courses aiming practice can be increased." (KB16-Foreign language education)

Participants who expressed their opinions under the theme of *education* stated that the elderly, adults or young people had problems in dealing with their jobs in various institutions and organizations, and that this problem was related to the lack of Turkish literacy or not knowing Turkish. They also underlined that foreign language education was carried out with a focus on grammar, whereas foreign language education should be given by focusing on verbal skills and making practice.

7th Theme: Law
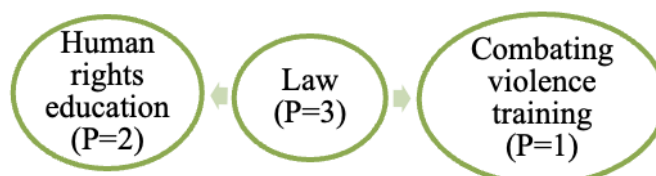
Figure 7. *Lifelong learning program proposal in the context of law theme*

Under the theme of *law*, another emerging theme, human rights education and combating violence training codes are included, and 3 participants made explanations related to the mentioned codes.

"Since the rights of women and girls are not properly respected in my city, I can only suggest a

program based on human rights rather than the rights of women and girls. As an example, the simplest way to limit the education rights of girls in Muş can be given." (KG22-Human rights education)

"There are so many children and women who are exposed to violence and killed on television every day and unfortunately in our close environment, so adults should be made aware of this issue. Accordingly, training on combating violence against women and children should be included in lifelong learning programs." (KG23-Combating violence training)

The participants, who proposed a lifelong learning program under the theme of *law*, mentioned the importance of providing an education based on human rights because the required sensitivity was not shown to the rights of women and girls and the barriers to girls' education were removed, and it is necessary to provide education on combating violence because children and women were victims of violence and were killed.

8ᵗʰ Theme: Art and Sport
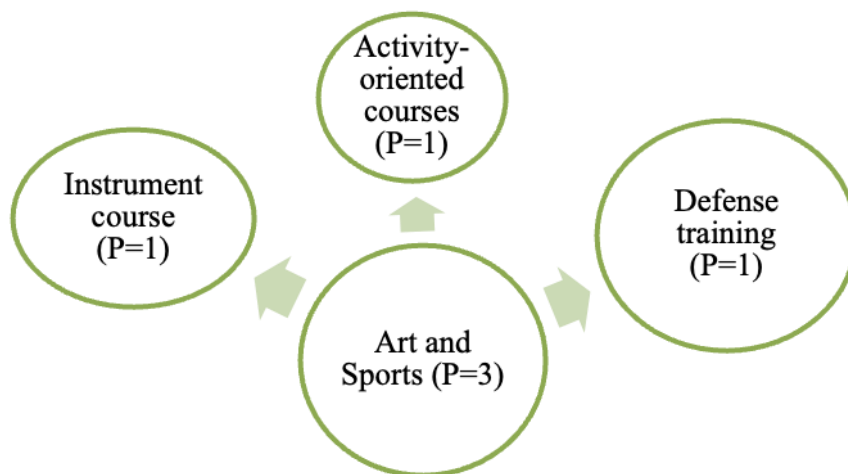
Figure 8. *Lifelong learning program proposal in the context of art and sports theme*

Under the theme of *art and sports*, which is the last theme that emerged in the study, there are codes for instrument courses, defense training and activity-oriented courses, and 3 participants reported their thoughts on the mentioned codes as follows:

"I haven't experienced it, but I think computer management course or computer course has become a necessity of this century. I also think that instrument courses such as guitar, baglama or drums courses are also necessary as a therapy of brisk life, both in terms of health and personal development" (KG9-Instrument course)

"I see incidents of violence against women very often around me. And that's why I want women to be trained to defend themselves. For example, karate, taekwondo, Muay Thai (Thai boxing) etc. courses can be given." (KG15-Defense training)

The participants, who expressed their opinions under the theme of *art and sports*, said that an instrument course such as guitar, baglama or drums was necessary in order to give peace to the soul of the individual in the flow of life and that women should receive defense training such as karate, taekwondo, Thai boxing in the context of violence against women, which had become one of the important problems of today.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

In this study, it was aimed to reveal the pre-service teachers' proposals for a lifelong learning program in accordance with the needs of the society. For this purpose, firstly pre-service teachers were asked to express their opinions on a lifelong learning program that takes the needs of the society into consideration. When the data obtained from 62 pre-service teachers were examined, it was seen that 20 pre-service teachers proposed a lifelong learning program, but they did not make any explanation. On the contrary, 42 of them expressed their ideas in detail and while proposing a lifelong learning program, they made detailed explanations. Based on this, it can be said that the majority of the pre-service teachers were more aware about the importance of lifelong learning. In a study conducted by Adams (2007), it was aimed to determine perceptions of 34 secondary school teachers about the characteristics of students with lifelong learning skills. The results obtained from the analysis of the quantitative data showed that students with lifelong learning skills should actively engage in learning, set their goals, have good communication skills, have basic literacy and numeracy skills, make researches, develop a set of organization skills, have improved social skills, have the capacity to embrace changes and demonstrate specific personal attributes that contribute to their capacity as lifelong learners. Solmaz (2017) and Gökyer et al. (2018) found that lifelong learning tendencies of pre-service teachers were at high level. On the contrary, Özen and Öztürk (2016) found that lifelong tendencies of pre-service teachers were at moderate level. Teachers have a key role in promoting the lifelong learning skills of the students in learning and teaching process (Klug et al., 2014). As a result, pre-service teachers should be given more opportunities at college education in order to improve their lifelong learning skills. Accordingly, universities should provide facilities for the students. The availability of technological equipment, access to information, and continuing education centers, which can be considered important for the concept of lifelong learning and supporting learning at higher education, may affect the perceptions of pre-service teachers about lifelong learning.

Within the first theme emerged with the name of *profession*, it was seen that 23 pre-service teachers stated that different courses such as farming training, beekeeping education, animal husbandry training, hairdressing course, business training, textile production, etc. should be included in a lifelong learning program that takes the needs of the society into consideration. Lifelong learning has various work-related benefits (Ting, 2015). According to Duţă and Rafailă (2014), lifelong learning has some economic and vocational aspects. On this issue, Dæhlen and Ure (2009) stated that the skills and knowledge acquired in lifelong learning programs could enhance employment prospects for the participants. Similarly, Tight (1998) emphasized that policy makers should prioritize vocation-related trainings to invest in lifelong learning process. Jenkins et al. (2003) found that participating in lifelong programs was effective for male respondents who left school earlier in terms of finding a job. Similarly, Rothes et al. (2014) obtained the finding that male respondents with a lower level of education in Portugal benefitted from lifelong learning programs in terms of finding a job. In addition, the participants who attended lifelong learning programs thought that they would find a job after completing the program. Similarly, in vocation-related programs, participants are generally highly motivated since they hope using newly acquired skills and knowledge for employment (Awuor, & Parks, 2015; Lowe, & Gayle, 2015). As seen, individuals who attend lifelong programs can benefit from increased work-related opportunities. In line with this, the pre-service teachers participated in this study also supported the idea that lifelong learning programs should include work-related trainings. Therefore, it can be argued that they were aware of the importance of the benefits that lifelong learning programs can offer for the individuals in finding a job or increasing their abilities and skills.

As the second theme that emerged in the study, under the *technology* theme, pre-service teachers stated that computers courses, technology education and distance education courses should be conducted within a lifelong learning program. Based on this, it can be argued that teachers are aware of the importance of technology to keep up with the changes encountered in all areas. When the literature

81

is examined, the importance of technology in promoting lifelong learning has been emphasized. Information technologies provide a technical environment for lifelong learning and they serve as a channel for information and educational resources (Syslo, 2004). In the study conducted by Miertschin et al. (2016), majority of the university students stated that the use of mobile devices helped them to develop lifelong learning skills. They also stated that with the use of mobile devices, they could find information from a wide variety of resources, integrate different ideas, use different learning strategies, participate actively in the learning process and learn from peers. According to Pureta (2015), as a result of the availability of mobile devices and the development of technology, mobile learning is a reasonable key solution for lifelong learning. Similarly Fischer and Konomi (2007) and Clough et al. (2008) were in the opinion that availability and widespread use of mobile devices provided opportunities for users and supported lifelong learning outside the formal learning contexts. Based on this, it can be concluded that the pre-service teachers support the use of technological devices to promote lifelong learning process. Nowadays, it is possible to follow the developments, changes and modernization in every field through computers and internet. Therefore, technology is an indispensable part of life. It can be argued that individuals can be lifelong learners by benefitting from technology during learning process.

Another theme that emerged based on the opinions of the pre-service teachers was *personal development*. The pre-service teachers stated that parent education, diction training, entrepreneurship education, risk analysis training, time management education, motivation education and communication education should take place in lifelong learning programs to promote personal development. The relationship between personal development and lifelong learning is presented by the researchers in the literature. According to Berker and Horn (2003), lifelong learning can be effective for personal development, thus individuals can have increased self-esteem. Ting et al. (2015) stated that in lifelong learning programs, personal development encompassed development in self-esteem, knowledge and skills as well as networking. Lifelong learning involves self-actualization of individuals. Individuals can achieve their personal development through lifelong learning. In the personal context, lifelong learning aims to enable the individual to perform better in the field he/she is interested in and to ensure his/her own personal development (Divjak et al., 2004). In this study, pre-service teachers pointed out that lifelong learning process provided personal development. Lifelong learning process affects personal development as a key factor. As a result, lifelong learning can help individuals to cope with the changing world conditions by enabling them to develop self-knowledge and self-development in line with their interests, abilities and curiosity.

Under the theme of *health and environment*, the codes which were health education, hygiene education, childcare education, disaster education, occupational health and safety education, recycling education and environmental education emerged. Environmental education can make great contributions to sustainable development. For this, the education on environment should not be limited to schools. Instead, it should become a lifelong process (Haigh, 2006). According to the report of World Health Organization (2020), education sector can help create healthier people and communities by ensuring availability and access to meaningful lifelong learning opportunities. In the research which was conducted by Yamashita et al. (2019), it was found that lifelong learning reflected a promising autonomous and sustainable strategy to improve health in later life. Based on the information presented in the literature, it is clear that health and environmental issues are two important aspects of lifelong learning. In the current study, the importance of health and environmental issues in terms of lifelong learning process was stated by the pre-service teachers, which indicated that pre-service teachers participated in the study were conscious about the issues related to health and environment. Therefore, in educational educational institutions, more learning opportunities should be provided to increase the awareness level of individuals about environment and health issues, which in turn may increase their lifelong learning skills.

Another theme emerged was *handicrafts* and the codes under this theme were sewing embroidery course, carpet weaving course and traditional shoes course. On the other hand, under the theme of *education*, 6 pre-service teachers stated that foreign language education and literacy course should be included in a lifelong learning program. In the study conducted by Köksal and Çöğmen (2013) it was found that pre-service teachers stated their opinions on the importance of learning a foreign language for being a lifelong learner. Additionally, they stated that lifelong learning was required to develop oneself. According to Czerkawski and Berti (2020), foreign language teaching strategies are required to foster lifelong learning. Similarly, there is a strategic and mutually strengthening relationship between literacy and lifelong learning. Literacy is essential in the success of individuals, organizations, institutions and society. Therefore, individuals who want to be lifelong learners should be provided with literacy skills (Solmaz, 2017). Based on this, it can be argued that increasing the literacy skills of individuals may increase their lifelong learning skills. Therefore, seminars and conferences should be held on lifelong learning and literacy education. Furthermore, educational programs related to the importance of lifelong learning and literacy education should be prioritised at universities.

On the other hand, under the theme of *law*, there were codes which were human rights education and combating violence training. Under the theme of *art and sports*, which was the last theme that emerged in the study, there were codes as instrument courses, defense training and activity-oriented courses. In the study, it was seen that pre-service teachers were aware of the different aspects of the lifelong learning process. In the OECD report (2020), it was stated that in Korea's lifelong learning system, there are some courses that prioritize enjoyment and self-development of the citizens. For example, courses such as calligraphy, languages, baking or handicraft are included in the lifelong learning programs in Korea.

Lifelong learning encompasses both formal and informal educational practices. Therefore, all educational activities, included in traditional education practices are within the scope of lifelong learning (Friesen, & Anderson, 2004). In the study, pre-service teachers mentioned about different courses that should be included in a lifelong learning program that aims to take the needs of the society into consideration. This result shows that pre-service teachers are aware of the different aspects of lifelong learning process and they think that different courses related to different fields should be started to foster lifelong learning process. Different courses within lifelong learning programs can help individuals to discover new interests and to learn new skills, and can open new opportunities and possibilities for them.

Lifelong learning is a supportive process that increases and strengthens the knowledge, values, skills and understandings that people have gained throughout their lives and enables them to apply them in real life (Aspin, & Chapman, 2000). Lifelong learning covers twenty first century skills and these skills are considered to be dramatically crucial to information societies. In lifelong learning programs, individuals are expected to develop various competencies in order to adapt to the rapidly changing world conditions (Dabbagh, & Castaneda, 2020). With the acquisition of these skills, continuous development of the society can be enabled (Cornford, 2002). Based on this, it can be said that pre-service teachers participated in this study are familiar with the needs of the people in the society and accordingly they are in the opinion that the courses on different professions can help individuals to be lifelong learners. Lifelong learning is a key factor in terms of teaching profession. In order to respond to the needs emerging with the 21st century and to adapt to the age, education systems have to constantly renew themselves. Teachers, one of the main parts of the education system, are one of the most important occupational groups in the world. In order to raise individuals who can meet today's needs, it is necessary to train teachers who improve themselves, know how to access information and use information. For this reason, teachers should constantly improve themselves and adopt lifelong learning as a principle. In addition, teachers should always assess and redesign their teaching methods for self-development. Within this context, courses on lifelong learning competencies should be included in

teacher education programs intensively. Additionally, activities and facilities should be carried out in order to increase the lifelong learning competences of pre-service teachers. The findings of the study were obtained from pre-service teachers. In this sense, recommendations can be written with the aim of increasing teachers' lifelong learning competences.

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Determining The Internet Risk Awareness of The Parents

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Article Info	ABSTRACT

Internet, personal computers, phones, tablets, etc. emerges as a communication network that provides global communication with smart technological devices. Although the Internet has introduced many innovations into our lives, it also contains some risks. This research was carried out to determine the internet risk awareness of parents. For this purpose, the interview form was used. In addition to the questions revealing the descriptive characteristics of the parents in the form, there are questions about whether there are problems encountered in the internet environment and what measures are taken for the problems encountered. In this direction, 20 parents of students studying at a private college in Konya were interviewed. Qualitative research method was use. In the study in which content analysis was used, it was determined that all of the parents used smart phones and used the internet for less than 3 hours a day. In addition, it was concluded that the majority of parents have social media accounts. In the research, it has been determined that none of the parents have encountered any health-related problems on the internet, but some parents have encountered problems in the social media usage process, communication, bankin"g and trade areas on the internet. In the research, it was determined that the parents resorted to security measures such as "uninstalling the application on the phone, not accepting notifications from unknown accounts, applying to cyber security, keeping privacy settings up-to-date, blocking the person, changing the password" for the problems they encountered during the social media usage process. In the research, it has been determined that the parents who encounter problems with communication on the internet resort to "blocking uncontrolled advertisements, blocking offers from unknown accounts, keeping information safe and not accepting messages from unknown accounts". In the research, it has been determined that the parents who encounter problems with banking transactions on the internet resort to security measures such as "contacting the bank, installing an antivirus program on their phone, taking other measures regarding banking transactions, and calling the bank by not entering their account". Finally, in the research, it has been determined that the parents who encounter problems related to commerce or shopping transactions on the internet resort to security measures such as "complaining to the authorities about the problem, choosing reliable sites, checking whether the sites are 3D reliable, and switching to virtual card application".

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INTRODUCTION

When the characteristics of the communication tools are examined, it is seen that the internet has a very different, inclusive and more detailed structure than the traditional mass media. On the Internet, the sound system of the radio, the features of the pictures, text and graphics in the newspapers, the features of the television images and sounds are all available. Internet; It provides the individual and social development of users in areas such as education, health, child development, communication and communication (Deng, Xu, Zeng & Qi, 2019). Thanks to the advantages it provides, it can be stated that the internet is an important part of life today. On the other hand, besides the stated benefits of the Internet, it is sometimes stated that it causes social deviation and lack of physical exercise in children in the developmental age (Latkovikj & Popovska, 2019; Yuhanna, Alexander & Kachik, 2020). In this case, users need to take preventive measures by understanding the positive and negative aspects of the internet (Yıldırım, 2014).

The age we live in is called the information age. One of the most important obligations of this age is to follow the technological development closely and adapt to it. Today, the phenomenon of globalization has entered all areas of our lives, the existence of the internet has made the globalizing world smaller and has become an important part of our lives. The internet, which has become an important part of our lives, has become a tool that can be good in the hands of good people and bad in the hands of bad people (Yıldırım, 2014; Usta, 2017).

Unlike other mass media (such as TV, magazines, and newspapers), the content provided on the Internet is generally available to the public free of charge and without any control process (Aslanidou & Menexes, 2008). In this case, it should not be forgotten that the internet offers many opportunities, but there are some online risks and dangers that may have negative effects (Zırhlıoğlu, 2011; Livingstone, Ólafsson, & Staksrud, 2013; Livingstone & Helsper, 2013; Padır, Eroğlu & Çalışkan, 2015; Odabaşı, Çoklar & Kabakçı, 2007; Toraman & Usta, 2018).

Problems encountered in the internet environment in research; sharing photos, personal e-mail addresses and other information with others, meeting strangers on the Internet, visiting pornographic web pages, cyberbullying and violence. In the study of Gündüz (2015), cyberbullying, online and offline communication with strangers, online fraud, unwanted and inappropriate content, hatred, violence, racism, sharing of private information, etc. It has been noted that the problems are the most frequently encountered problems on the Internet. Livingstone, Haddon, Görzig, and Ólafsson (2010) conducted a study on 9-16 year olds in 25 countries, found that 14% of children have encountered pornography on the Internet in the last 12 months, 6% have received ugly and harmful content, and 30% have never met people. conclusion has been reached. It can be emphasized again that the Internet contains many dangers for children and it is important for families to take precautions. In order to take precautions for their children, it has been considered important and researched that families determine the risks in different areas on the Internet and the precautions they take in the context of their experiences.

Despite the possibilities it offers, the Internet is a technology that should be used safely and consciously. There are various preventive measures against the negative effects and dangers that users may encounter online (Canbek & Sağıroğlu, 2007). According to a study conducted by Ogur et al. (2017), it was stated that internet users take precautions such as not approving the requests of strangers to add friends, deleting messages from the problematic person and blocking the person, adjusting their privacy settings, and stopping sending. In Aksoy's (2019) research, it was determined that most of the internet users take precautions against the problems they encounter while using the internet, such as using anti-virus software on their computers and using software to monitor the websites visited.

There has been a significant increase in internet usage in recent years, both in terms of usage and user profile (Okyere, 2022; Wan, Lighthall & Paulson, 2022). Individuals from all walks of life, from children to the elderly, use the internet. While the impact of social media plays an important role in this

increase, such as the digital transformation in areas such as education, health and commerce, the change and increase of communication channels (Hunsaker & Hargittai, 2018; Matthews, Nazroo & Marshall, 2019), the COVID-19 global pandemic also influenced this increase (Bilodeau, Kehler, & Minnema, 2021). Parents have important responsibilities regarding their children's internet use (Odabaşı et al., 2007). There are studies on internet risks and precautions taken by families (Khurana, Bleakley, Jordan & Romer, 2015; Byrne Lee, 2011; Livingstone et al., 2010). However, Griffioen and Sinopoli (2021) stated that the internet has developed and includes new opportunities and risks with its features. On the other hand, it is stated that this situation is affected more especially after the COVID process (Wan, Lighthall & Paulson, 2022). In this respect, the recent internet risks of families were considered important and investigated in the study.

In connection with the explanation above, the problem of this study is "What is the internet risk awareness level of parents?" formed in the form. What kind of problems does the family face in this regard and what measures can be taken? It is thought that the research is important in terms of seeking answers to questions such as:

The purpose of this research is to determine the internet risk awareness of parents and the precautions they take for risks. In line with this purpose, answers were sought for the following sub-objectives:

- What are the problems faced by families in the process of using social media?

- What measures are taken against the problems experienced during the use of social media?

- What are the problems faced by families for communication purposes?

- What measures are taken against the problems experienced for communication purposes?

- What are the problems faced by families in the field of banking?

- What measures are taken to address the problems experienced in the field of banking?

- What are the problems faced by families in the field of trade or shopping?

- What measures are taken against the problems experienced in the field of trade or shopping?

- What are the problems faced by families regarding their health status?

- What measures are taken for the problems experienced in the field of health?

The desire of people to search better and faster increases the expectations and searches on the internet and provides a smooth structure. For this reason, the internet creates a new communication environment by separating interpersonal communication and mass communication. Today, people can use personal computers and hundreds of computers with international capabilities. In a sense, the Internet is the sum of networks and provides instant access to information from anywhere in the world.

In recent years, the internet has started to play a very effective role in the socialization of individuals, in the relationship between individuals and the social environment, and in social life (Castells, 2005). While there are evaluations emphasizing the positive effect of the Internet, there are also evaluations emphasizing its negative effects. Some researchers (Okyere, 2022; Yuhanna, Alexander & Kachik, 2020) have stated that the internet has negative effects such as weakening social relations in society, revealing a group of people who live computer life and ignore the environment. Some other researchers (Latkoviki & Popovska, 2019; Gündüz, 2015) define the internet as a new dimension of social interaction. According to them, internet users can easily establish relationships that they cannot establish in normal life with interactive tools, and can make friends from all over the world in an environment where there are no borders (Karaca, 2007).

In this study, it has been considered important and researched what problems parents face and what kind of security measures they take for this, especially on the internet, which has increased usage after the COVID process.

METHOD

In this part of the research, the model of the research, the study group, the data collection tool used, the collection and analysis of the data are included.

Research Model

The study was carried out in the case study pattern, which is one of the qualitative research methods. Case studies are observed phenomena related to a single field in a certain time period or time (Gerring, 2007).

Participants

The participants of the research are the parents of the students in a private college in Konya. 20 parents, who are engaged in banking and commercial transactions on the Internet and use social media intensively, participated in the research. Participants were determined by convenience sampling method. Personal characteristics of the parents are presented in the table below (Table 1).

Table 1. *Personal characteristics of parents*

	Gender	Age	Marital Status	Monthly Income Level (Tl)	Level of Education
X1	F	38-43	Married	4251 and more	Postgraduate
X2	F	32-37	Married	4251 and more	High School Graduate
X3	F	38-43	Married	4251 and more	Bachelor's Degree
X4	M	44 and over	Married	4251 and more	Bachelor's Degree
X5	F	38-43	Married	4251 and more	Bachelor's Degree
X6	F	38-43	Married	4251 and more	Postgraduate
X7	M	32-37	Married	4251 and more	Bachelor's Degree
X8	F	32-37	Married	4251 and more	Associate Degree
X9	M	38-43	Married	4251 and more	Postgraduate
X10	F	32-37	Married	4251 and more	Bachelor's Degree
X11	M	32-37	Married	4251 and more	Bachelor's Degree
X12	F	38-43	Not Married	4251 and more	Bachelor's Degree
X13	F	32-37	Married	Less than 2750	Bachelor's Degree
X14	F	38-43	Married	4251 and more	Postgraduate
X15	F	32-37	Married	4251 and more	Bachelor's Degree
X16	F	44 and over	Married	4251 and more	Bachelor's Degree
X17	F	38-43	Married	4251 and more	Bachelor's Degree
X18	F	32-37	Married	4251 and more	Postgraduate
X19	F	32-37	Married	4251 and more	Associate Degree
X20	F	32-37	Married	4251 and more	Postgraduate

When Table 1 is examined, it can be said that most of the participants are female, married and between the ages of 30-40. Table 2 shows the estimations of the parents' use of smartphones and their duration and social media usage.

Table 2. *Smartphone and social media usage situations*

Parents	Smartphone Usage	Daily internet usage time (hours)	Social media Usage
X1	Yes	Less than 3	Yes
X2	Yes	Less than 3	Yes
X3	Yes	Less than 3	No
X4	Yes	Between 5-6	Yes
X5	Yes	Less than 3	Yes
X6	Yes	Between 3-4	Yes
X7	Yes	Less than 3	No
X8	Yes	Between 3-4	Yes

X9	Yes	Less than 3	Yes
X10	Yes	Less than 3	Yes
X11	Yes	6 and more	Yes
X12	Yes	Between 3-4	Yes
X13	Yes	Between 3-4	Yes
X14	Yes	Between 5-6	Yes
X15	Yes	Less than 3	Yes
X16	Yes	6 and more	Yes
X17	Yes	Less than 3	No
X18	Yes	Between 3-4	Yes
TX19	Yes	Less than 3	Yes
X20	Yes	3-4 saat arası	Yes

It was determined that all the parents participating in the study used smart phones and half of the parents had a daily internet usage time of less than 3 hours (Table 2).

Research Instruments and Process

In this study, a semi-structured form was used to collect data. The reason for choosing the interview technique in the study is that it is an effective method used to understand the internet risk awareness level of the parents and how they understand the internet world and the risks they face (Salman Yıkmış, 2020). Another reason is the belief that with this method, parents will be more comfortable and can express themselves better.

There are two sections in the form. In the first part, there are questions about gender, age, marital status, monthly income level. In the second part, there are questions to determine the internet risk awareness of the parents and the measures taken against these risks. The topics and the areas affected by the internet were determined by asking two experts working as computer teachers. These questions are about whether there are problems in the fields of communication, banking, commerce or shopping and health in the process of using social media and on the internet, and if so, what kind of measures are taken. In the study, the opinions of two different field experts were taken during the preparation of the interview form. The semi-structured form was examined while it was being developed by two experts working in the field of computer and instructional technology education, and necessary corrections were made after this review. A preliminary pilot study was conducted with a parent for a trial purpose, and corrections were made after this interview. The interview with this parent was not included in the research analysis process. The interviews with the parents, which lasted for about 15-20 minutes, were recorded on tape, and the interview data were transcribed.

The necessary permissions were obtained from the Necmettin Erbakan University Social and Human Sciences Scientific Research Ethics Committee and the Ministry of National Education to carry out the research.

The approaches and terms used for validity and reliability in qualitative research differ according to researchers. For example, the terms credibility, transferability, reliability and verifiability should be used for validity (Creswell, 2018). Importance was given to credibility and transferability in ensuring the validity of the study. In addition, attention was paid to the impartiality of the researchers in the process of obtaining the comprehensibility of what the parents said and the credibility of the data that allows searching for patterns among what they said, and the opinions expressed in this context were controlled by participant confirmation (Merriam, 2013). In order to ensure the external validity of the study, the method of the study, the sample selection and the processing process including the characteristics of the participants were presented in detail in order to transfer the study to similar studies (Merriam, 2013; Creswell, 2018). The answers obtained from the interviews were coded as X1, X2, X3...X15 according to the participants. The results obtained in the interviews were confirmed by the participants. The answers given after the coding were tabulated.

Data Analysis

In the analysis of the data, frequency distributions were included to reveal the personal characteristics of the participants, and content analysis was used in the analysis of the answers given to the interview questions. Content analysis is a research technique used to draw repeatable and valid conclusions from data about its content (Yıldırım & Şimşek, 2011). The Miles-Huberman model was used as a basis for the content analysis used in the analysis of the data obtained in the study. This model aims to provide a conceptual basis for the recognition of the data set that researchers frequently collect in the data analysis obtained for qualitative data analysis and the application problems arising from the lack of methodology (Baltacı, 2017). The analyzes made by the two researchers were compared and the similarity rate was calculated as 89%.

Ethic

The research was carried out with the permission of the ethics committee of Necmettin Erbakan University, Social and Human Sciences Scientific Research Ethics Committee, dated 10.09.2021 and dated 2021/468.

FINDINGS

In the study, firstly, the problems faced by the participating parents in the social media and the security measures they took were investigated, and the results are given in Table 3.

Table 3. *Encountering problems in the process of using social media and the security measures taken*

	Have you encountered any problems in the process of using social media?	If Your Answer Is "Yes", What Kind of Security Measures Did You Take for This Problem?
X1	Yes	I uninstalled apps
X10	Yes	I try not to open notifications from places I do not know or do not know.
X12	Yes	I resorted to cyber because my account was stolen. Afterwards, I was more careful with the accounts I opened.
X15	Yes	In order to be protected from fake and troll accounts, I keep the privacy settings up-to-date and use the blocking feature frequently.
X16	Yes	I block the person
X18	Yes	I changed the password
X20	Yes	While using the Instagram application, from time to time, you receive a private message about the Instagram rule violation and ask for a password. For this problem, I blocked the message account and reported it to the instagram application.

Table 3 shows the results about whether any problems were encountered in the process of using social media. This section also includes the results of what kind of security measures are taken in case of encountering a problem in the process of using social media. Accordingly, it is seen that 7 of the parents encountered problems in this area (X1, X10, X12, X15, X16, X18 and X20), while the other parents did not encounter any problems.

Considering the precautions taken by some parents who encountered the problem.

I uninstalled apps (X1),

I try not to open notifications from places I do not know or do not know (X10),

While using the Instagram application, from time to time, you receive a private message about the Instagram rule violation and ask for a password. For this problem, I blocked the message account and reported it to the instagram application. (X20)

Based on the findings, it can be stated that parents who encounter any problems in the process of using social media exhibit a conscious attitude towards it. In this process, it is seen that the parents mostly resort to the prevention method. It is obvious that social media will face various problems in this field with the increase in its place in human life. It is seen that there are users who encounter problems such as the violation of private life, sharing of private information, exposure to unwanted advertisements.

Table 4. *The situation of encountering any problems in the field of communication in the internet environment and the security measures taken*

	Have You Encountered Any Problem Regarding "Communication" on the Internet?	If Your Answer Is "Yes", What Kind of Security Measures Did You Take for This Problem?
X9	Yes	I block uncontrolled ads
X10	Yes	I don't know how to take a security measure
X12	Yes	I got offers from people I don't know. I block people I don't know.
X15	Yes	I keep my information safe, I do not accept messages from people I do not know on social media.

In Table 4, the results regarding whether any problems are encountered regarding communication processes in the internet environment are given. This section also includes the results of what kind of security measures are taken in case of communication related problem. Accordingly, it is seen that 4 of the parents encountered problems in this area (X9, X10, X12 and X15), while the other parents did not encounter any problems.

Considering the precautions taken by the parents who encountered the problem;

I block uncontrolled ads (X9)

I don't know how to take a security measure (X10)

I got offers from people I don't know. I block people I don't know(X12)

Based on the results obtained, it can be stated that the parents are conscious of not sharing everything about their private life during the internet usage process and what the limits of their sharing are.

Table 5. *The situation of encountering any problems in the field of banking in the internet environment and the security measures taken*

	Have You Encountered Any Problem Regarding "Banking" Transactions on the Internet?	If Your Answer Is "Yes", What Kind of Security Measures Did You Take for This Problem?
X11	Yes	I contacted the bank and gave the information. I installed antivirus on my phone. I took other precautions regarding banking transactions.
X17	Yes	I couldn't get into my account. I called the bank.

Table 5 shows the results of whether any problems related to banking transactions are encountered in the internet environment. This section also includes the results of what kind of security measures are taken in case of a banking-related problem. Accordingly, it is seen that 2 of the parents encountered problems in this area (X11 and X17), while the other parents did not encounter any problems.

Considering the precautions taken by some parents who encountered the problem.

I contacted the bank and gave the information. I installed antivirus on my phone. I took other precautions regarding banking transaction (X11)

I couldn't get into my account. I called the bank (X17).

In the context of the results obtained, the fact that the majority of the parents do not encounter any problems in the field of banking shows that they use the internet responsibly. In any case, it should not be forgotten that the main responsible for internet use is the user. In this area, it can be stated that the user's self-control for the sites that create bank content is important.

Table 6. *The situation of encountering any problems in the field of commerce or shopping on the Internet and the security measures taken*

	Have You Encountered Any Problem Regarding "Trade" or "Shopping" Transactions on the Internet?	If Your Answer Is "Yes", What Kind of Security Measures Did You Take for This Problem?

X1	Yes	I complained to the authorities
X8	Yes	We use reliable and well-known sites so that there are no fakes or faulty products.
X9	Yes	I pay attention to whether the sites are 3D or not.
X10	Yes	I prefer secure sites.
X15	Yes	Only shopping from trusted sites and paying attention to whether there is a 3D application while shopping with a card.
X17	Yes	I switched to security app.
X18	Yes	I started using virtual cards for shopping.

Table 6 contains the results regarding whether any problems have been encountered regarding commerce or shopping transactions on the internet. This section also includes the results of what kind of security measures are taken in case of a problem in the trade or shopping area. Accordingly, 7 of the parents encountered problems in this area (X1, X8, X9, X10, X15, X17, X18), while the other parents did not encounter any problems.

Considering the precautions taken by some parents who encountered the problem.

I complained to the authorities (X1)

We use reliable and well-known sites so that there are no fakes or faulty product (X8)

Only shopping from trusted sites and paying attention to whether there is a 3D application while shopping with a card (X15).

In the context of the results obtained, it can be stated that parents prefer an effective identity and data verification system against those who create commercial content. From this point of view, it is necessary to take state-based security measures of the trading site in commercial transactions to be made on the internet. In addition, it is necessary to prevent the personal information of users who are members of the site from being sold to different stakeholders.

Table 7. *Any problems related to health status on the internet and the security measures taken*

	Have You Encountered Any Problems Regarding "Health" on the Internet?	If Your Answer Is "Yes", What Kind of Security Measures Did You Take for This Problem?
-	-	-

In the Table 7, there are results regarding whether any health-related problems are encountered in the internet environment. This section also includes the results of what kind of security measures are taken in case of a problem in the trade or shopping area. Accordingly, it was concluded that all parents did not encounter any problems in this area. This result shows that parents are conscious about the processing of information on the internet, the accuracy of health-related news and related information. In other words, parents check and investigate the accuracy of the news in terms of information about their health status and the reliability of the advertiser source. This situation minimizes the damage of information pollution.

CONCLUSION

The Internet environment has many positive effects such as providing children with fast and effective access to information, facilitating communication and online education opportunities. However, what should not be forgotten or ignored is that in addition to these positive effects, negative effects of the internet environment can also be seen (Canbek & Sağıroğlu, 2007). Individuals should use the internet by being aware of the potential risks in the internet environment (Bacon et al., 2008). The development of the Internet environment exposes families and schools to many risks (Recalde-Viana, Sádaba-Chalezquer, & Gutiérrez-García, 2015). This study was carried out to determine the internet risk awareness of parents. The following results were obtained in the research:

In the results obtained regarding the problems encountered by the parents participating in the research in the process of using social media, it was concluded that 7 of them faced problems and 13 of them did not encounter any problems. It has been determined that parents take security measures such as "uninstalling the application on the phone, not accepting notifications from unknown accounts, applying for cyber security, keeping privacy settings up-to-date, blocking the person, changing the password" for the problems encountered.

In the results obtained regarding the problems faced by the parents participating in the research regarding communication on the internet, it was concluded that 3 of them faced problems and 17 of them did not encounter any problems. It has been determined that parents take security measures such as "blocking uncontrolled advertisements, blocking offers from unknown accounts, keeping information safe and not accepting messages from unknown accounts" for the problems encountered.

In the results obtained regarding the problems that the parents participating in the research encountered regarding banking on the internet, it was concluded that 2 of them faced problems and 18 of them did not encounter any problems. It has been determined that parents take security measures such as "contacting the bank, installing a virus program on their phone, taking other precautions regarding banking transactions, and calling the bank by not logging into their account" for the problems encountered.

In the results obtained regarding the problems encountered by the parents participating in the research regarding the trade or shopping transactions on the internet, it was concluded that 7 of them had problems and 13 of them did not encounter any problems. It has been determined that parents take security measures such as "complaining to the authorities about the problem, choosing reliable sites, checking whether the sites are in 3D reliability and switching to virtual card application" for the problems encountered.

In the results obtained regarding the health-related problems faced by the parents participating in the research on the internet, it was concluded that all parents did not encounter any problems in this area.

DISCUSSION

In this study, the problems faced by parents during internet use and the preventive measures taken against these problems were investigated. In the findings obtained in the research, it was determined that some parents encountered some problems in the process of using social media. For these problems, it was noted that parents took security measures such as "uninstalling the application on the phone, not accepting notifications from unknown accounts, applying for cyber security, keeping privacy settings up-to-date, blocking the person, changing the password". Social media sites are sites designed for adult use in general. Some sites have an age limit. In the study conducted by Burnukara and Uçanok (2010), it was determined that users resort to methods such as not dealing with incoming messages, changing the phone number they use, and changing their e-mail address regarding the risks encountered in the social media environment.

In another finding obtained in the study, it was determined that parents resort to security measures such as "blocking uncontrolled advertisements, blocking offers from unknown accounts, keeping information safe and not accepting messages from unknown accounts" in order to solve the problems they encounter regarding communication on the internet. In the study conducted by Arıcak et al. (2012), it was determined that he resorted to methods such as notifying the site administrator of the problem he was experiencing, and preventing malicious people from communicating with them by blocking their accounts. In the study conducted by Ogur et al. (2017), it was determined that they resorted to measures such as not accepting friendship offers from strangers, deleting messages from problematic people and regulating their privacy settings. In Bayzan's (2016) study, it was stated that communication risks mostly arise as a result of communication between internet users and people they do not know. In particular, it has been determined that abusers who communicate with children sexually abuse and violate privacy

through online communication.

In another finding obtained in the research, it was determined that the parents resorted to security measures such as "contacting the bank, installing a virus program on their phone, taking other measures regarding banking transactions and calling the bank by not entering their account" in solving the problems they encounter regarding banking on the internet.

In the research, it has also been determined that the parents resort to security measures such as "complaining to the authorities about the problem, choosing reliable sites, checking whether the sites are 3D reliable, and switching to virtual card application" in solving the problems they encounter regarding commerce or shopping transactions on the internet. In the study conducted by Algür and Cengiz (2011) it was determined that the problems encountered by the participants in the internet environment were mostly in the areas of security of credit cards and non-compliance with the confidentiality of identity information. In the study conducted by Walrave et al. (2008), it has been determined that users are faced with risks such as incurring financial damage as a result of unrealistic company advertisements on the internet, and the capture of personal information via e-mail. In the study of Topçu et al. (2013), it was determined that users resort to these risks by applying the security settings of their accounts.

RECOMMENDATIONS

In line with the results obtained in this research, it can be recommended to conduct new studies on different provinces and sample groups. In addition, the views of parents were used in the study to reveal internet risk awareness. In future research, teachers and school administrators can be included in the research as other stakeholders of the subject and the subject can be examined in depth. In the study, qualitative analysis method was used to reveal internet risk awareness. In future research, comparison of internet risk awareness can be made according to various variables (such as gender, marital status and education level) by applying the survey method, one of the quantitative patterned methods. Trainings can be given to inform parents about the risks that may be encountered in internet use. It is thought that experience is important for parents' risk perceptions. Parents can be given different usage experiences and their experiences in risk and precautionary perceptions can be researched.

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The Mediating Role of Resilience between Career Adaptability and Life Satisfaction[1]

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Article Info	ABSTRACT
	This study sought to investigate the mediating role of resilience between career adaptability and life satisfaction among Turkish university students, drawing on the LD approach. A total of 287 university students, 226 (78.7%) of whom were female and 61 (21.3%) were male, participated in the study. Participants' ages varied, from 19 to 37, with a mean of 21.23 (SD = 2.36). The mediating role of resilience in the relationship between career adaptability and life satisfaction was tested using structural equation modelling. In this study, it was found that resilience has a partial mediating role in the relationship between career adaptability and life satisfaction. This finding shows that career adaptability positively predicts life satisfaction both directly and indirectly via resilience in university students. The results indicated that it is easier for university students with high career adaptability to adapt to adverse conditions and recover themselves. Thus, these university students may evaluate their lives as more satisfactory. Both theoretical and practical consequences of the study's findings are given.

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INTRODUCTION

The Turkish economy is having difficulty meeting the needs of a significant number of working-age individuals because of fluid economic conditions, refugee influx, currency devaluation, political obstacles, and international terrorism (Büyükgöze-Kavas & Autin, 2019). As a matter of fact, Turkey is among the countries with the lowest employment rate (56.4%) of recent tertiary graduates (Eurostat, 2021). Turkey is among the countries with the highest the neither in employment nor in education or training rate (38.1 %) in 2020. This rate is well above the 17.6 %, European average (Eurostat, 2020). In order to be able to work in a government institution, they have to take and pass the examination (the Public Personnel Selection Examination) held once a year. Many students strive for many years to be successful in this exam. Because, as Masdonati and Fournier (2015) stated, diplomas no longer guarantee direct employment in a short time, either in Turkey. This prolongs the school-to-work transition period for Turkish university students. The prolongation of the passage from school to work may create difficulties in the identity construction of individuals who are neither full students nor full employees (Masdonati & Fournier, 2015; van Vianen et al., 2015). On the other hand, within the scope of COVID-19 precautions, university students had to continue distance education in Turkey. Many restrictions and distance education have brought along many problems such as mental health problems, and lack of motivation in Turkish university students (Taşçı, 2021). Briefly, it can be said that there are many risk factors for reducing the life satisfaction of university students under current conditions. Therefore, it can be expected that Turkish university students need more help to design their lives and careers in the face of the unpredictable and rapid changes of the 21st century.

In the 21st century, people need to develop skills different from the professional skills required for 20th-century professions and learn to cope with uncertainty, career troubles, and career transitions (Nota et al., 2014). The Life Design (LD) approach has been introduced as a lifelong self-construction process aimed at developing these skills and competencies in life projection (Savickas et al., 2009). By concentrating on the processes of adaptation, regulation, and self-identity, the LD method expands the person-environment fit and career development approaches (Nota & Rossier, 2015). People may use these procedures to organize and design their life, as well as their career development and personal paths (Savickas et al., 2009). The LD approach focuses on strengthening an individual's set of resources useful in overcoming developmental tasks, managing work and career transitions, coping with personal and career troubles, and their achieves satisfaction from their experiences (Hartung, 2015; Rossier, 2015). On the one hand, this approach highlights the importance of essential resources to help young people to be employed and design their career futures. On the other hand, it emphasizes the importance of essential resources that will help adults adapt themselves to changes in the labor market, the outcomes of economic and political transformations, and abrupt technological and scientific developments (Savickas et al., 2009). In the LD approach, career adaptability and positive psychological resources are beneficial to coping with uncertainty, adversity, and change (Santilli et al., 2020). Considering that career adaptability and resilience may important in coping with uncertainty, difficulty, and change, as well as promote life satisfaction, the present study focused on these variables as key resources. Personal resources regulate people's vocational behaviour (van Vianen et al., 2015) and help them cope with stressors (Hobfoll, 1989, 2002, 2011). Therefore, personal resources may play a central role in life satisfaction among university students.

The capacity to utilize adaptable strategies such as concern, control, curiosity and confidence is referred to as career adaptability (Savickas, 2002, 2005). The concern is an individual's proactive and forward-oriented evaluation of their career. Control refers to a person's faith that she or he is in charge of her or his career. Curiosity is about being open to career exploration. Confidence is an individual's perception of efficacy in successfully implementing and executing career development (Savickas & Porfeli, 2012). During career transitions, career adaptability serves as a key self-regulation contraption for operating stress and boosting well-being (Ramos & Lopez, 2018). In addition, orienting on the future, coping with career transitions and changes, and adapting to changing conditions can contribute to improved life satisfaction (Wehmeyer, 2015). The results of previous studies found that career adaptability positively predicted life satisfaction and subjective well-being (Büyükgöze-Kavas et al., 2015; Kırdök & Bölükbaşı, 2018; Marcionetti & Rossier, 2019; Öztemel & Yıldız-Akyol, 2021). Based on theoretical explanations and

previous research findings, it was hypothesized that career adaptability will positively predict life satisfaction (Hypothesis 1). In addition, previous studies have found that career adaptability positively predicts resilience (Ginevra, Maggio et al, 2018; Santilli et al., 2020). Therefore, it was hypothesized that career adaptability will positively predict resilience (Hypothesis 2).

In an age of fast change and unpredictability, resilience may be an important resource that can help college students pursue their career development and achieve their career goals. Resilience is underlined as the basis of positive human development in literature (Lerner, 2006; Ungar et al., 2013). According to Masten (2014), resilience is a dynamic system's ability to adjust successfully to adversity that threatens its function, vitality, or development. Resilience supports compliance and reduces the negative effects of troubling life events (Jacelon, 1997). Besides, resilience is a phenomenon that is noticed, learned, and includes a developmental process (Masten et al., 1990). In many previous studies, resilience was found to be positively related with life satisfaction and well-being in university students (Bajaj & Pande, 2016; Cohn et al., 2009; Gündoğan, 2021; Miranda & Cruz, 2022; Wu et al., 2021). Based on theoretical explanations and previous research findings, it was hypothesized that resilience will positively predict life satisfaction (Hypothesis 3).

Subjective well-being refers to how and why people have pleasant experiences in their life, encompassing both cognitive and emotional reactions (Diener, 1984). The emotional indices of subjective well-being are positive and negative affect. The cognitive indicator of subjective well-being is life satisfaction (Diener et al., 1999). Individuals set a suitable standard for themselves and compare their conditions with that standard and make subjective evaluations of their lives (Diener et al., 1985). These evaluations may be related to specific areas such as job, academic, and marriage, or they may be a general evaluation of the individual's life. Moreover, individuals may be satisfied with most areas in their lives and still be generally dissatisfied due to the influence of one area (Pavot et al., 1991). There is empirical evidence showing the importance of career adaptability and resilience in boosting life satisfaction. Based on theoretical explanations and previous research findings, it has been hypothesized that there will be a mediator role of resilience in the relationship between career adaptability and life satisfaction (Hypothesis 4).

Based on the LD approach, the present study aims to study the relationships among career adaptability, resilience, and life satisfaction of Turkish university students. Employing LD approach, various studies has been carried out in different participant groups and countries on why relationship exists between career adaptability and life satisfaction. For example, the results of the previous studies showed that the relationship between career adaptability and life satisfaction are mediated by hope in Italian workers with mild intellectual disability (Santilli et al., 2014), resilience in the parents of children with mild intellectual disability in Northeast Italy (Ginevra, Maggio et al, 2018) and in middle school students in Italy and Belgium (Santilli et al., 2020), future orientation in university students in Italy and Spain (Cabras & Mondo, 2018) and Italian and Swiss adolescents (Santilli et al., 2017), courage in Italian high school students (Ginevra, Magnano et al., 2018) and Italian university students (Magnano et al., 2021), and self-determination in Italian adults who substance use disorder (Di Maggio et al., 2021). The empirical studies on the basis of the LD approach have primarily been performed in Western countries with individualistic cultural characteristics. In individualistic cultures, behaviours guided by personal goals, being more cooperative rather than competitive, and high personal benefits are at the forefront. The collectivist cultures, on the other hand, prioritize collective goals over individual ones, emphasizing ideas like cohesiveness, interdependence, and belonging within social groupings (Hofstede & Hofstede, 2005; Markus & Kitayama, 1991). Turkish society, on the other hand, shows a tendency from collectivist culture to individualistic culture and has both cultural characteristics (İmamoğlu, 1998). Therefore, this study is important in terms of providing evidence for the intercultural applicability of the LD approach. Emphasizing the importance of resilience in the association between career adaptability and life satisfaction may help university students construct their futures and perceive their lives more satisfying via preventive intervention programs. Furthermore, the results of the present study are expected to extend previous studies on the intercultural applicability of the LD approach by emphasizing the value of career adaptability and resilience in promoting life satisfaction in a society that combines individualistic and collectivist cultural characteristics.

METHOD

Research Design

The relational survey model was used in this study because the relationships among career adaptability, resilience, and life satisfaction were examined using structural equal modeling. The relational survey model is a survey model that examines the mutual change between two or more variables (Karasar, 2011).

Participants

The convenience sample method was used to recruit 287 Turkish university students for this study. There were 226 females (78.7%) and 61 males (21.3%). The participants' ages ranged from 19 to 37, with a mean of 21.23 (SD = 2.36). 130 of the participants are first-year students, 67 are second-year students, 63 are third-year students, and 27 are fourth-year students. Most of the participants (91.6%) perceive their socio-economic status as middle level.

Measures

Career Adapt-Abilities Scale – Short Form (CAAS-SF)

CAAS-SF is the short form of the 24-item CAAS-International Form 2.0 (Savickas & Porfeli, 2012) created by Maggiori et al. (2017). CAAS-SF consists of 12 items and four sub-dimensions with three items in each sub-dimension. Answers to CAAS-SF are given on a 5-point Likert scale. Participants answered the items in degrees between not strong (1) and strongest (5). Sub-dimensions are concern (e. g. "Becoming aware of the educational and vocational choices that I must make"), control (e. g. "Counting on myself"), curiosity (e. g. "Observing different ways of doing things"), and confidence (e. g. "Working up to my ability"). The validity and reliability studies of the Turkish CAAS-SF were investigated by Işık et al. (2018). Confirmatory factor analysis fit indices for the sample of university students χ^2/ df = 2.13; GFI = .95; CFI = .96; RMSEA = .059 was found in the scale adaptation study. A positive correlation was found between the Turkish CAAS-SF and career decision self-efficacy (r = .66). Cronbach Alpha reliability of Turkish CAAS-SF was found as .76 to .90 for the university students' sample. The test-retest reliability of the Turkish CAAS-SF was found as .62 to .82 (Işık et al., 2018). The Cronbach Alpha reliability was found .87 in the current data.

The Brief Resilience Scale (BRS)

Smith et al. (2008) developed the BRS, 6-items (e. g. "I usually come through difficult times with little trouble"), 5-point Likert-type scale. Participants answered the items in degrees between strongly disagree (1) and strongly agree (5). The psychometric properties of the Turkish BRS were investigated by Doğan (2015). Confirmatory factor analysis fit indices for the sample of university students χ^2/ df = 1.83; GFI = .99; CFI = .99; RMSEA = .05 was found and support single factor structure in the scale adaptation study. A positive correlation was found between the Turkish BRS and happiness and ego resilience (r = .40 and r = 61, respectively). The Cronbach Alpha reliability of Turkish BRS was found .83 (Doğan, 2015). The Cronbach Alpha reliability was found .85 in the current data.

The Satisfaction with Life Scale (SWLS)

Diener et al. (1985) developed the SWLS, 5-items (e. g. "So far I have gotten the important things I want in life"), 7-point Likert-type scale. Participants answered the items in degrees between strongly disagree (1) and strongly agree (7). The validity and reliability studies of the Turkish SWLS were examined by Durak et al. (2010). Confirmatory factor analysis fit indices for the sample of university students χ^2/ df = 2.02; CFI = .99; TLI = .98; RMSEA = .043 was found and support single factor structure in the scale adaptation study. A positive correlation was found between the Turkish SWLS and positive affect and monthly income (r = .31 and r = 13, respectively). The Cronbach Alpha reliability of Turkish SWLS was found .81 (Durak et al., 2010). The Cronbach Alpha reliability was found .87 in the current data.

Procedure

This study was confirmed by the university ethics commission. The data were collected online with Google Forms. In order to prevent lost data, participants were compulsory to mark all items in Google Forms. Before completing the items, the participants came across a text describing the purpose of the study and became participants voluntarily.

Analysis Plan

The data were analyzed by structural equation modeling using AMOS and SPSS package programs. The BRS items were parceled out to represent latent variables to decrease the number of parameters to be estimated, enhance reliability, and lessen the danger of violating the normality assumptions (Landis et al., 2000; Little et al., 2013). The factor analysis was performed for BRS to create the parcels; the items were ranked according to the factor load and were distributed to each parcel in a balanced and orderly manner. This process resulted in three parcels representing the three parcels representing the latent variable of resilience. Five statistical indices and cut-off scores in line with the recommendations of Browne and Cudeck (1993), and Hu and Bentler (1999) were used for satisfactory goodness of fit values: The $\chi^2/$ df ratio (≤ 3), CFI $\geq .90$, GFI $\geq .90$, and RMSEA $\leq .08$. Recommended of Preacher et al. (2007), the significance of the mediation of resilience between career adaptability and life satisfaction was tested using the bootstrapping technique.

Ethic

Ethical approval was obtained for this study from the Scientific Research and Publication Ethics Committee of the Nevşehir Hacı Bektaş Veli University (2021.09.297).

RESULTS

Preliminary Analysis

Before performing the mediation analysis with the structural equation model, the data were prepared for analysis, and the assumptions were tested. Since the data was collected online with Google Forms, the participants were provided to answer all the items. Therefore, there was no missing data in the data set. One outlier found using the Mahalanobis distance test was removed from the dataset. Analyzes were performed with data collected from 287 participants. Since the skewness and kurtosis estimates of the variables varied within the range of ± 1.5, the assumption of normal distribution was met (Table 1). The correlation coefficients between the variables were less than .90. In addition, variance inflation factor values were less than 10 (range 1.54 to 3.04). Therefore, there was no multicollinearity problem (Tabachnick & Fidel, 2013). The correlation estimates between the study variables and descriptive statistics results are displayed in Table 1.

Table 1. *Correlation estimates and descriptive statistics*

Variables	1	2	3	α	M	SD	Skewness	Kurtosis
1. Career adaptability		**.36**	**.35**	.87	49.49	6.73	-.350	-.350
2. Resilience	.32		**.31**	.85	18.64	4.91	-.047	-.255
3. Life satisfaction	.32	.29		.87	19.87	6.44	.096	-.378

Note. All correlations are significant *p* < .01. Bold values are latent variable correlations.

Mediation analysis

Before the mediation analysis, the goodness of fit of the measurement model was evaluated. Goodness-of-fit values for the measurement model were satisfactory ($\chi^2 = 128.916$; df = 51; $\chi^2/$ df = 2.52; GFI =.93; CFI = .95; TLI = .94; RMSEA = .073). The factor loads of the observed variables ranged from .65 to .91, all of which were statistically significant ($p < .001$). Afterward, the structural model presented in Figure 1 was tested and the same goodness-of-fit values were found as an indication that the structural model was saturated. Career adaptability significantly predicted life satisfaction before being included in the resilience the structural model ($\beta = .36$, $p < .001$). When resilience was included in the model as a mediating

variable, career adaptability significantly predicted life satisfaction, but its predictive power was reduced (β = .28, p < .05). The reason for this is that career adaptability predicts resilience (β = .37, p < .001) and resilience predicts life satisfaction (β = .22, p < .001), respectively. The standardized total effect of career adaptability on life satisfaction was .36, the standardized direct effect was .28, and the standardized indirect effect was .08.

Adhering to the views of Preacher et al. (2007), the bootstrap technique (10000) was used to test the significance of the mediation of resilience between career adaptability and life satisfaction. The 95% confidence interval for the indirect effect ranged from .032 to .146 and did not include zero. Thus, the mediating role of resilience was significant. The path coefficients of the structural model, direct and indirect effects are displayed Table 2.

Table 2. Path coefficients of the structural model, direct and indirect effects

Paths	β	SE	95% CI	
			Lower	Upper
Direct Path				
Career adaptability → Life satisfaction	.28	.05	.125	.487
Career adaptability → Resilience	.37	.07	.237	.438
Resilience → Life satisfaction	.22	.04	.077	.355
Indirect Path				
Career adaptability → Resilience → Life satisfaction	.08	.02	.032	.146

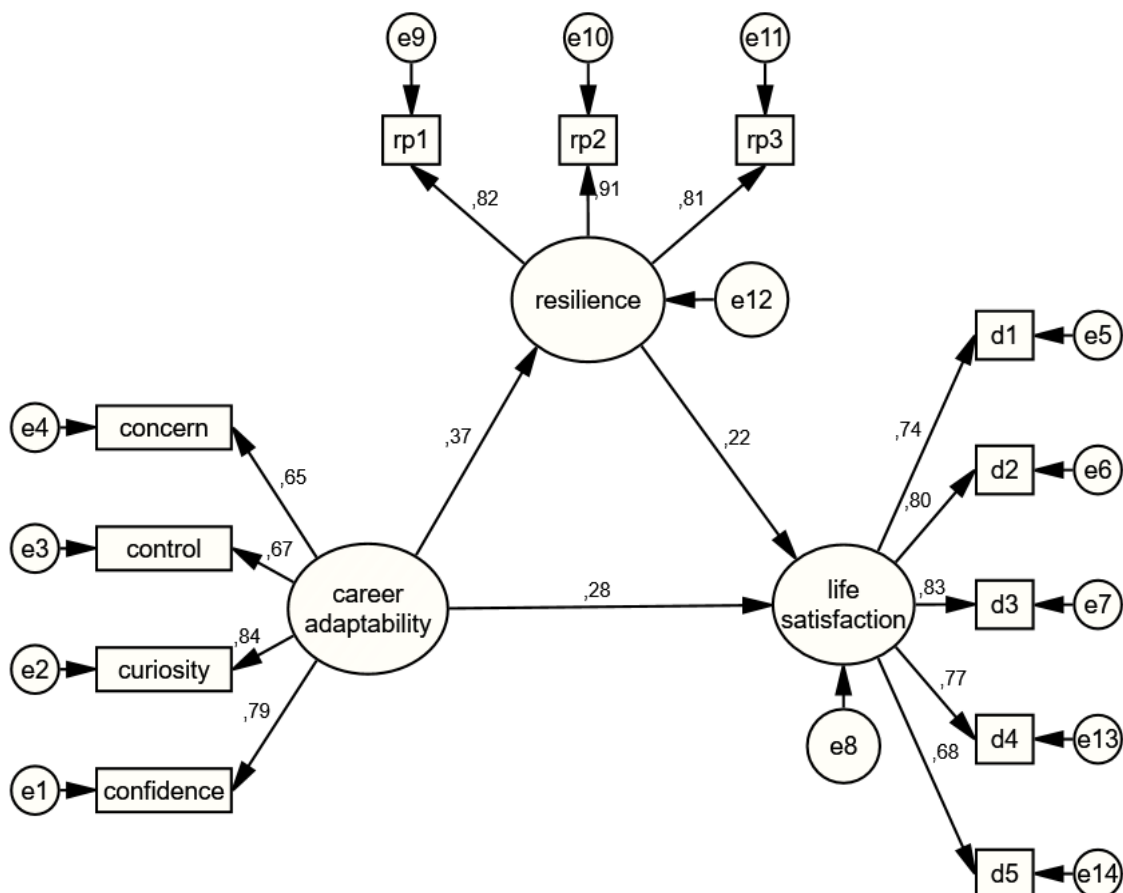*Note.* β = Standardized estimate; SE: Standard error; CI: Confidence intervals

Figure 1. *Standardized coefficients of the model (all coefficients are significant); rp: resilience parcel*

DISCUSSION

This study sought to investigate the mediating role of resilience between career adaptability and life satisfaction among Turkish university students, drawing on the LD approach. The results show that life happiness is predicted by career adaptability both directly and indirectly through resilience.

The results demonstrated that career adaptability bolsters university students' life satisfaction. This result supports Hypothesis 1. Namely, the result of this current study indicates that having psychosocial resources to deal with career development duties, career transitions and traumas may contribute to increased life satisfaction. The results of this study support the results of many preceding studies that found that career adaptability positively predicted life satisfaction and subjective well-being (Hirschi, 2009; Parola & Marcionetti, 2021; Ramos & Lopez, 2018; Wilkins et al., 2014). The individuals, who have a positive attitude to prepare for their future roles, perceive their life and career under their own control are constantly curious to explore the self and the outside world, and believe that they can cope with obstacles and transitions may feel more life satisfaction. The results of this study are coherent with the LD approach that career adaptability helps people plan their uncertain futures, dealing adverse working conditions, adapt to changes in the labor market conditions, and thus increases their well-being (Savickas, 2012, 2015; Savickas et al., 2009). Moreover, the results of this study, coherent with the career construction model of adaptation that adaptability resources (career adaptability) are important for adaptation outcomes (life satisfaction; Savickas, 2005, 2013; Savickas & Porfeli, 2012) as well as with the results of the meta-analysis studies on the career construction model of adaptation (Rudolph et al., 2017). Besides, this result is compatible with the theoretical views of Hartung and Teber (2008), who stated that career construction increases meaning and satisfaction in life.

In this study, it was found that career adaptability predicted resilience positively. This result supports Hypothesis 2. The result of this study is coherent with the results of the previous studies that found that career adaptability positively predicted resilience (Ginevra, Maggio et al, 2018; Xu et al., 2020). This result complies with the LD approach that career adaptability may include, promote, or be associated with other personal resources that facilitate career transitions and career adjustment (Rossier, 2015). This result also complies with the LD approach that contextual and personal resources help individuals access other valuable resources (van Vianen et al., 2015). This result of the present study indicates that the capacity to use self-regulation strategies and psychosocial resources boosts the successful adaptation of the individual to the difficulties that threaten her/his functionality and development.

In this study, it was found that resilience predicted life satisfaction positively. This result supports Hypothesis 3. The result of this study is coherent with the results of the previous studies that found that resilience positively predicted life satisfaction (Hu et al., 2015; Kalaitzaki et al., 2021; Karaman et al., 2020; Mak et al., 2011). This result also complies with the LD approach that key resources will facilitate people's well-being (van Vianen et al., 2015). This result of the present study indicates that the successful adaptation of the individual to the difficulties that threaten her/his functionality and development boosts life satisfaction.

The results of the current study show that career adaptability indirectly predicted life satisfaction through resilience. This result partially supports Hypothesis 4. This result gives considerable clues as to how the relationship between career adaptability and life satisfaction occurs and the mechanism underlying this relationship. While this result provides cross-cultural evidence for the LD approach, it highlights that resilience is a malleable personal resource for coping with the uncertainty, insecurity, and instability of the 21st century, providing supporting evidence for the LD approach. Moreover, these results are in line with the views of the LD approach that career adaptability can strengthen personal resources and contribute to well-being (Rossier, 2015). Resilience partially carries the effect of career adaptability on life satisfaction. These results support the results of past studies that found that resilience has a mediating role in the relationship between career adaptability and life satisfaction of parents with mildly mentally retarded children (Ginevra et al., 2018) and, middle school students (Santilli et al., 2020). Given that career adaptability is a self-regulation mechanism and a psychosocial resource for facing difficulties, managing career transitions, and coping with traumas (Savickas, 1997, 2002), it may be easier for university students with high career adaptability to reach positive adaptation in the face of challenging conditions and bounce quickly after sinking. That is career adaptability may boost personal resources such as resilience among university students. Thus, they may get greater satisfaction from life. There

is because career adaptability has the power to increase personal resources (Nota & Rossier, 2015) such as resilience, and resilience protects the individual against negativities by enabling the individual to swiftly recover the energy needed to respond when faced with adversity (Masten, 1989; Masten et al., 2006).

The results of this study stressed the significance of increasing career adaptability and resilience in fostering university students' life satisfaction. Practitioners may develop and implement intervention or training programs to improve the career adaptability of university students. Practitioners may improve the resilience of university students through activities that improve their career adaptability. Thus, their life satisfaction may increase. Similarly, intervention or training programs that strengthen resilience may be developed and implemented. Counsellors may help clients' careers construct and boost their resilience. Thus, it may be ensured that university students are stronger in the face of 21st-century uncertainty, insecurity, and rapid changes.

Although the results of the current study provide a deeper understanding of how career adaptability and life satisfaction are related, serial mediation may be tested by adding more variables in future studies. Future studies may have an experimental or longitudinal design. Thus, it may be possible to draw causal inferences. For the generalizability of the study results, this study may be replicated in secondary school, high school students, and working adult samples.

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How Do Personality Traits Influence Adolescents' Career Anxiety and Self-Efficacy in Making Career Decisions?

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Article Info	ABSTRACT
	The aim of this study was to search for the links between adolescent career anxiety, career decision-making self-efficacy, and adjective-based personality traits, as well as to see how predictive adjective-based personality qualities are for career anxiety and decision-making self-efficacy. A total of 710 students, 511 girls (72%) and 199 boys (28%) from various high schools in Istanbul, Turkey, made up the research group. Predictive correlational model was used in the analysis of the data while Career Anxiety Scale, Career Decision-Making Self-Efficacy Scale and Adjective-Based Personality Scale were used as data collection tools. After providing the normality assumptions and checking extreme values, data analysis was carried out. Standard multiple regression analysis was performed to examine the predictive potential of personality traits based on adjectives on career anxiety and career decision-making self-efficacy, while Pearson Correlation analysis was utilized to determine the relationship between the variables. As a result of the study, several significant correlations between adolescent career anxiety, career decision-making self-efficacy, and adjective-based personality traits were discovered. It was also discovered that adjective-based personality traits predicted career anxiety and competence expectation in career decision-making.

INTRODUCTION

The Career is the succession of events that occur throughout one's life, including advances, pauses, and regressions in employment and profession (Özyürek, 2016; Yeşilyaprak, 2019). Along with these changes that individuals experience throughout their lives, their development processes can also be affected by various positive or negative emotions such as anxiety (Baltes, 1987). One of the frequently encountered situations during adolescence that negatively affect career development and specifically career choice is *career anxiety* (Vignoli, Croity-Belz, Chapeland, Fillipis, and Garcia 2005).

Career anxiety is the fear of failure that negatively affects the career development of the individual (Vignoli, 2015) and such an indecision affects career choice and career development (Tsai, H. Hsu, & Y.C. Hsu, 2007). It is a concept that addresses the detrimental impacts of career development brought on by a lack of information (Pisarik, Rowell, & Thompson, 2017) and the negative emotions experienced during career decision-making process (Fouad, 2007; Saka et al., 2008). In some cases, some certain amount of anxiety when making career-related decisions can help individuals prepare themselves for career-related tasks (Cho, 2008; Harren, 1979). However, if the anxiety experienced reaches to an uncontrollable level, it ceases to be beneficial and may negatively affect the career choice of the individual (Shin & Lee, 2019). Adolescents in transition, such as those choosing a higher education program in the formal school system, might be considered as an important group in this regard because their decisions may have long-term consequences on their career development.

There are some studies on *career anxiety* of adolescents (e.g., (Campagna & Curtis, 2007, p.94; Corkin et al., 2008, p. 87; Daniels et al., 2011, p. 417; Hawkins et al., 1977, p. 401; Kaplan and Brown, 1987; Peng, 2005, p. 300) which mostly examine the relationship between career or vocational indecision and anxiety. It is widely assumed that university students comprise the majority of the sample group in relevant studies, and high school teenagers are the subject of a small proportion of them. The findings of these research suggest that there is a positive association between anxiety and career or vocational indecision, and that trait anxiety is more helpful than state anxiety in reducing career anxiety. Furthermore, it has been discovered that adolescent anxiety during the career development process is often linked to exam anxiety, future anxiety, and unemployment anxiety (Alkan, 2014; Ayyıldız, 2015: 182; Kaya & Varol, 2004; Şanlı Kula & Saraç, 2016, p. 240). When the relationship between vocational indecision and career anxiety in high school students is examined, it is observed that as the students' vocational indecision grows, their career anxiety regarding choosing a profession grows as well (Nalbantoğlu Yılmaz & Çetin Gündüz, 2018b, p. 41).

Another psychological factor affecting the career development of adolescents is supposed to be *career decision-making self-efficacy*. A similar concept of efficacy expectation was first used in the literature in Bandura's (1977) social learning theory (Dursun & Kara, 2019). In his theory, Bandura (1977) defined efficacy expectancy as the sum of an individual's ability and perceptions on any subject. The concept of career self-efficacy was first explained in social cognitive career theory (Betz & Hackett, 1981). Career decision-making self-efficacy is individuals' confidence in their ability to fulfill and perform tasks related to career choice and commitment (Taylor & Betz, 1983); an important situation that guides individuals and affects their career development (Betz, 2007; Klassen & Chiu, 2010). It can be defined as the individual's beliefs about himself/herself (Betz & Hackett, 1981) regarding the individual's ability to fulfill the career development tasks expected from him/her during the career development period he/she is in. Showing skills in self-assessment, conducting research on the professions one wishes to pursue, creating objectives, preparing for the purpose, and problem-solving behaviors are some examples of career development tasks that are strongly associated to this notion (Crites, 1976). Having a high level of career decision-making self-efficacy in fulfilling career development tasks is generally associated with positive career attitudes, high self-esteem and clearer professional identity (Choi et al., 2012). Individuals with a high level of career decision-making self-efficacy are more likely to participate in career exploration and planning activities, identify career interests, constantly work towards career goals, and have greater success (Hou, Wu, & Liu, 2014). Maintaining a high level of career decision-making self-efficacy is a positive indicator that adolescents take initiative in career research and planning activities to identify and further

111

refine their career interests and career goals (Lent et al., 2000). On the contrary, low career decision-making self-efficacy levels are often associated with vulnerability to stress and depression (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001), as well as some career decision-making difficulties that lead to career indecision (Gati et al., 2011).

Research on career decision-making self-efficacy in adolescents report a positive and significant relationship with career decision-making self-efficacy and family social support (Xing & Rojewski, 2018), stronger sense of self-identity (Kim & Yang, 2019), career research behaviors (Blustein, 1989), career maturity and career adjustment (Chung, 2002; Patton & Creed, 2001) while a negative relationship with career indecision (Taylor, Klein, & Betz, 1996) is reported. Additionally, research findings (Gushue, Clarke, Pantzer, & Scanlan, 2006) demonstrate that self-efficacy in career decision-making clearly depicts professional identity and enhances people's behavior while considering their career options. Also, evidence (i.e., Abidin et al., 2019) suggests that gifted students have stronger self-efficacy in vocational decision-making than their non-gifted classmates. It is also stated that people who have high career decision-making self-efficacy are more focused on their goals than those with a low expectation of making a career plan, participating in the career research process, and making career decisions (Rogers, Creed, & Glendon, 2008).

Personality traits are another psychological aspect that influences how adolescents pursue their careers. According to studies, personality traits have a substantial impact on choosing a career (Yeşilyaprak, 2012). Systems that encompass all of an individual's overall emotional, physical, and intellectual traits are referred to as their personality (Bacanlı, İlhan, & Aslan, 2009; Burger, 2006; Yelboğa, 2006). To put it another way, personality is described as a set of structures that include all psychological and physiological aspects in order to comprehend an individual's emotional, behavioral, and cognitive features (Mount et al., 2005). Five factor personality theory (McCrae & Costa, 1985), which is one of the approaches to explain personality, attempted to unify the idea of personality by taking into account the previous definitions. Studies related to this approach show that explanations about personality can be grouped under five different concepts. These concepts can be named as extraversion, neuroticism, agreeableness, conscientiousness and openness to experience which can be briefly defined as follows:

- *Extraversion;* It represents the friendly, social and affectionate aspects of individuals who love to have fun, are talkative, like to joke, like to win (McAdams, 2008; McCrae & Costa, 1985). Individuals with this characteristic are those who like to establish good relations with other people, have a positive outlook on life, and have developed social relations with their environment. Individuals with this feature care about those around them and also expect other people to notice them (Barrick & Mount, 1991).
- *Agreeableness;* Individuals with this personality trait are more likely to cooperate with others. These individuals are friendly towards others and come to the fore with their social, kind, tolerant, forgiving, warm and reassuring and collaborative nature (Glass, Prichard, Lafortune, & Schwab, 2013; Kayadibi, 2019).
- *Conscientiousness;* People with this trait are distinctive with their self-control and self-discipline features. They act in a planned manner and proceed with determination towards their plan. Individuals with these characteristics are known for being organized, hard, meticulous, and responsible, as well as being effective, competent, attentive, and practical at work (McCrae & Costa, 1985).
- *Neuroticism;* This concept corresponds to the state of neuroticism. While people with a high level of this trait feel restless, anxious and stressed, those with low levels are more balanced, harmonious and able to cope with stress (Glass, Prichard, Lafortune, & Schwab, 2013; Lounsbury & Gibson, 2009). Individuals with this personality trait are more likely to use their emotional characteristics to deal with challenges or stress in their life (Kayadibi, 2019).
- *Openness to experience;* It encompasses people's openness to life experiences and multiple interests. Individuals with this personality trait are known for their knowledge-seeking, adventurous, creative, imagination and curious aspects (Bozioneles, 2014).

As can be seen, the majority of participants in studies on personality traits based on the five-factor personality theory are college students. According to these studies, an individual's personality traits can be influenced by both personal and systemic variables. In their study examining five factor personality traits, career success, and general mental ability, Judge et al. (1999) found that personality traits positively predicted intrinsic (i.e., career satisfaction) and extrinsic (i.e., income and job status) career success. Furthermore, neuroticism was found to be a negative predictor of external career success and a favorable predictor of overall mental capacity. In a research by Seibert and Kraimer (2001) with employees from various professions and business fields; it was found that extraversion was positively related to salary level, promotion and career satisfaction; neuroticism was negatively related to career satisfaction; agreeableness was negatively related only to career satisfaction; and openness to experience trait was negatively related to salary level. Lounsbury, Hutchens, and Loveland (2005), in another study examining the relationship between career indecision and personality traits of middle and high school students, also found that career decision-making status of students was positively related to personality traits of conscientiousness, openness to experience, and agreeableness. Besides, neuroticism personality trait was found to be negatively related to career decision making. Kayadibi (2019) found a significant negative relationship between career anxiety and conscientiousness and agreeableness, and a positive relationship between neuroticism in his study with high school students. Hoseinifar et al. (2011) showed a negative significant association between creativity and neuroticism in a study of high school students, but a positive significant relationship between creativity and extraversion, as well as agreeableness, self-control, and openness to experience.

Given the content, purpose, and, in particular, the features of the populations studied in the literature, it can be concluded that this study will make a significant contribution to knowledge about the effect of personality traits on career anxiety and self-efficacy in adolescents' career decision-making. The relationship between adolescents' career anxiety, career decision-making self-efficacy, and personality traits are also investigated in this study, which is probing to what extent adjective-based personality factors predict career anxiety and career decision-making self-efficacy.

METHOD

In this section, information about the research design, participants, measurement tools and data analysis are given.

Research Design

The link between career decision-making self-efficacy and career anxiety, as well as the extent of personality trait prediction on these variables, were examined in this study using the predictive correlational analysis technique. In order to evaluate the correlations between the variables, this analysis is performed to determine the predictive potential of the unknown variable based on the known value. If the number of predictor variables is two or more, such correlational designs are called multifactorial (Büyüköztürk et al., 2014).

Participants

The study group of the research consists of students from different high schools in Arnavutköy district of Istanbul. Of the participants, 511 (72.0%) were girls and 199 (28.0%) were boys, and the ages of the participants ranged from 14 to 19. Of the participants, 202 (28.5%) were 9th graders, 219 (30.8%) 10th graders, 156 (22.0%) 11th graders, and 133 (18.7%) were 12th grade students. Demographic information about the participants is given in Table 1.

Table 1. *Demographic information of the participants*

	Frequency (f)	Percentage (%)
9th Grade	202	28.5
10th Grade	219	30.8
11th Grade	156	22.0
12th Grade	133	18.7
Girls	511	72.0
Boys	199	28.0
Total	710	100.0

Research Instruments

Research data were collected using the Career Anxiety Scale, the Career Decision-Making Self-Efficacy Scale, and the Adjective-Based Personality Scale. Below is a summary of these measurement instruments.

Career Anxiety Scale: It was developed by Gündüz and Yılmaz (2016) to determine the career anxiety of adolescents in their professional development processes. The scale consists of two sub-dimensions (anxiety about career choice and anxiety about family influence) and 14 items. Within the scope of the scale's internal consistency reliability, the cronbach's alpha value for the anxiety about career choice sub-dimension was found to be .797, and the cronbach alpha value for the anxiety about family effect sub-dimension was .742. Goodness-fit indices of the scale were reported as; $\chi2/sd=2.518$, RMSEA=0.067, CFI=0.95, NFI=0.92, NNFI=0.94, SRMR=0.055, GFI=0.92 and AGFI=0.90. The item-factor loadings were between .399 and .588 in the anxiety about family effect sub-dimension; In the sub-dimension of anxiety about choosing a profession, it was found to be between .313 and .577.

Adjective-Based Personality Test: It was developed by Bacanlı, İlhan, and Aslan (2007) to determine the personality traits of adolescents. In their study on construct validity, it was revealed that the scale consisted of five sub-dimensions and 40 items: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. These five dimensions explained 52.6% of the total variance. In the external criterion validity study, the Sociotropy Scale, Conflict Response Scale, Negative-Positive Emotion Scale, and Trait Anxiety Inventories were used, and the external criterion validity of the scale was found to be sufficient. The Cronbach Alpha internal consistency coefficient, which was also repeated for this study, was found to be .92 for the whole scale.

Career Decision-Making Self-Efficacy Scale: It was developed by Betz, Klein, and Taylor (1996) and adapted into Turkish by Işık (2010). The scale consists of 25 items. As the scores obtained from the scale increase, the career decision competence expectations of the individuals increase. In the reliability analysis results; The Cronbach alpha internal consistency value was found to be .88. The validity study was examined with the confirmatory factor analysis method and the fit index values; GFI = .90, AGFI = .90, CFI = .92, RMSEA = .048, SRMR=.078 (Işık, 2010). The Cronbach alpha internal consistency value, which was repeated for the study, was found to be .89.

Data Analysis

Standard multiple regression analysis was used to determine the effectiveness of adjective-based personality traits in predicting career decision-making difficulties and self-efficacy, and Pearson correlation analysis was used to determine the relationship between career decision-making self-efficacy, career decision-making anxiety, and personality traits. Prior to data analysis, the Mahalanobis distance was computed for the extreme values in the data set. Data from the remaining 710 participants were used for the analyses after the data that did not fit this requirement was removed. Additionally, it was determined whether the data set adheres to the following assumptions before performing the standard multiple regression analysis (Can, 2018);

• Variables are scored at least with the interval scale and show normal distribution,

• Absence of autocorrelation,

• The predicted variables are independent from each other, that is, there is no high correlation between the variables,

• There is a linear (significant) relationship between the predictor and the predicted variables.

As a first step, the assumption of normality was examined. The kurtosis and skewness values were checked for the assumption of normality, and it was found that these values were normally distributed ranging between +1 and -1 (Morgan, Leech, Gloeckner, & Barrett, 2012), as seen in Table 2.

Table 2. *Descriptive analyzes of participants' career anxiety, career decision-making self-efficacy, and personality traits*

	n	$\bar{x}$	Sd	Kurtosis	Skewness
1. Career Anxiety	710	37.2002	12.61781	.159	-.347
2. Career Decision-Making Self-Efficacy	710	89.7800	16.18250	-.444	.210
3. Neuroticism	710	26.0147	7.25315	.082	-.097
4. Extraversion	710	44.0298	10.25964	-.412	-.295
5. Openness to Experience	710	40.9898	7.97096	-.500	.080
6. Agreeableness	710	46.5833	9.47291	-.623	.367
7. Conscientiousness	710	36.0750	8.08733	-.546	.016

In the second step, the emergence of autocorrelation in the analysis which may be as a consequence of improper type of analysis, not including some variables in the model or incorrect analysis (Uysal and Günay, 2001, p.278) is inspected. Durbin-Watson d value was examined in order to determine the autocorrelation between the variables. The acceptable value of Durbin Watson d value is between 1.5 - 2.5 (Field, 2005). As a result of this analysis, Durbin Watson d values of 1.915 and 1.931 show that the assumption of multiple regression analysis is met.

As the third step, variance amplification factor and tolerance values were calculated. Multicollinearity is the predictor of the selected variables, and the correlational relationship between at least two variables is very high (Kacar & Sarıçam, 2015). Since a high correlation between the variables means that the variables measure the same things, one of the variables should be excluded from the analysis. It is necessary for this assumption that the variance amplification factor value is less than 10 and the tolerance value is greater than 0.2 (Field, 2005). In this study, the tolerance value related to the prediction of career anxiety and career decision-making self-efficacy was in the range of 46 - .88, and the variance amplification factor value in the range of 1.13 - 2.17. These findings can be interpreted as there is no problem of multicorrelation between the variables.

Finally, the correlation values between the variables were examined in order to determine the relationship levels between the predictor and the predicted variables. If the correlation coefficient is between 0 and 0.30, there is no relationship between the variables, if it is between 0.31 and 0.49, there is a weak relationship between the variables; Between 0.50 – 0.69 is a moderate relationship; If it is between 0.70 and 1.00, it is interpreted as a high (strong) relationship (Büyüköztürk et al., 2014). After providing the aforementioned assumptions for multiple regression analysis, the analysis was carried out using the Statistical Package Program for Social Sciences (SPSS 25.0).

Ethic

Ethics committee approval was obtained from TED University Human Subjects Ethics Committee (Approval Nr. 27535802-199) in 05 November 2020.

FINDINGS AND DISCUSSION

This research sought to determine the predictive relationship between adolescent personality traits, career anxiety, and career decision-making self-efficacy. The results of the initial Pearson correlation analysis, which was done to identify the relationship between career anxiety, career decision-making efficacy expectation, and personality traits based on adjectives, are shown in Table 3.

Table 3. *Relationships between career anxiety, career decision-making competence and personality traits*

	1	2	3	4	5	6	7
1. Career Anxiety	1						
2. Career Decision-Making Self-Efficacy	-.45**	1					
3. Neuroticism	.20**	-.24**	1				
4. Extraversion	-.24**	.42**	-.04	1			
5. Openness to Experience	-.17**	.36**	.07	.67**	1		
6. Agreeableness	-.07	.20**	-.07	.48**	.53**	1	
7. Conscientiousness	-.23**	.40**	-.11**	.60**	.55**	.58**	1

(*p<0.05, **p<0.01)

Table 3 shows a positive and significant relationship (r= .20, p< .01) between career anxiety and neuroticism, one of the personality sub-dimensions based on adjectives, extraversion (r= -.24, p< .01). A negative significant relationship was found between openness to experience (r= -.17, p< .01) and conscientiousness (r= -.23, p< .01). No significant relationship was found between career anxiety and agreeableness (r= -.07, p> .05). Among the personality sub-dimensions a significant positive correlation was found between, extraversion (r= .42, p< .01), openness to experience (r= .36, p< .01), agreeableness (r= 20, p< .01), and conscientiousness (r= .40, p< .01) and a negative significant relationship was found with neuroticism (r= -.24, p< .01) sub-dimension.

Personality traits as predictors of career anxiety

Standard multiple regression analysis was used to determine which personality traits may be predicting career anxiety and the results are shown in Table 4.

Table 4. *Standard multiple regression analysis results of personality traits as predictors of career anxiety*

	B	Sd	β	T	p	Dual r	Partial R
(Constant)	41.526	3.147		13.194	.000		
Extraversion	.328	.063	.188	5.208	.000	.198	.193
Agreeableness	-.197	.063	-.160	-3.118	.002	-.238	-.117
Neuroticism	-.100	.081	-.063	-1.227	.220	-.170	-.046
Openness to Experience	.207	.061	.155	3.382	.001	-.068	.126
Conscientiousness	-.270	.077	-.173	-3.490	.001	-.234	-.130

R= .34 R^2=12
$F_{(5,704)}$= 18.499   p= .000

According to the results of the multiple regression analysis, personality traits of conscientiousness, agreeableness, openness to experience and extroversion predict 12% of career anxiety while neuroticism does not seem to have a significant (R=0.34, R^2=0.12, p<.05) predictive contribution. Using the standardized regression coefficient (β) as a guide, the relative important predictor variables on career anxiety are; extraversion, conscientiousness, agreeableness, openness to experience, and neuroticism respectively. Extraversion, agreeableness, openness to experience, and conscientiousness are significant predictors of career decision-making self-efficacy when the t-test results regarding the significance of the regression coefficients are evaluated. The neuroticism variable, on the other hand, does not have a significant effect on career anxiety.

It is reported that adolescents' career indecision often causes them to experience anxiety (Vignoli, 2015). Studies examining this issue (Mojgan et al. 2011; Nalbantoğlu Yılmaz & Çetin Gündüz, 2018) similarly show that indecision significantly predicts career anxiety. A positive and significant relationship was found between neuroticism, one of the personality sub-dimensions, and career anxiety (see Table 3). In other words, as the level of neuroticism increases, career anxiety also increases. Similarly, a positive and significant relationship was found in a study conducted by Kayadibi (2019) on high school students. The relationship between career anxiety and adjective-based personality is an infrequent topic among researchers, yet there are some studies (e.g., Chamorro-Premuzic et al. 2008; Vreeke & Muris, 2012) exploring the relationships between the five-factor personality traits and anxiety. It is reported in these studies that anxiety and neurotic personality traits are related constucts. Similarly, some other researchers found a negative relationship between career success (Seibert & Kraimer, 2001), career decision making (Lounsbury, 2005) and neuroticism which are in line with this research findings.

A negative and significant relationship between extraversion and career anxiety is another finding of this research. Some studies (i.e., Kayadibi, 2019) reported no relationship between extraversion and career anxiety; however, although there is no research directly examining the relationship between these two variables, there are some studies reporting positive significant relationships between extraversion and career maturity (Atli, 2017), career decision making (Page et al., 2008; Pecjak, & Kosir, 2007) and career choice (Gökdeniz, & Merdan, 2011). In addition, the presence of negative significant relationships between extroverted personality trait and social phobia (Heiser et al., 2003; Noyan & Berk, 2007) partially overlaps with the results of the research.

Researchers often indicate that there are negative significant relationships between the trait of openness to experience and career anxiety. In one of these, Kayadibi (2019) found that this relationship is not significant. However, although they do not exactly examine the relationship between career anxiety and openness to experience, there is a positive relationship between openness to experience and career research behaviors (Li et al., 2015), career reality (Onay & Uzel, 2011) and career adaptability (Aktaş & Şahin, 2019). There are some commonalities when these factors are taken into account as potential sources of career anxiety. In another study examining the relationship between career decision making and openness to experience (Lounsbury et al., 2005), which can be considered as a similar structure, no significant relationship was found contrary to the findings of this research.

In contrast to the findings of no significant relationship between career anxiety and agreeableness, negative significant relationships between these variables have been identified in the literature (Kayadibi, 2019; Yam & lhan, 2016). Also, the existence of a negative and substantial association between career anxiety and conscientiousness, according to the findings of this study, shows that career anxiety diminishes as conscientiousness grows. Similar results are seen in studies that reach the same conclusions as this result in the literature (Kayadibi, 2019; Yam & lhan, 2016).

Personality traits as predictors of career decision-making self-efficacy

The results of the standard multiple regression analysis to evaluate personality factors that influence career decision-making self-efficacy are shown in Table 5.

Table 5. *Standard multiple regression analysis results of personality traits as predictors of career decision-making self-efficacy.*

	B	Sd	β	T	p	Dual r	Partial R
(Constant)	68.823	3.648		18.866	.000		
Extraversion	-.518	.073	-.232	-7.100	.000	-.243	-.258
Agreeableness	.360	.073	.228	4.922	.000	.417	.182
Neuroticism	.368	.094	.181	3.896	.000	.357	.145
Openness to Experience	-.289	.071	-.169	-4.069	.000	.189	-.152
Conscientiousness	.470	.090	.235	5.243	.000	.399	.194

R= .527 R^2= .28
$F_{(5,704)}$= 54.222   p= .000

Table 5 reveals a modest and substantial relationship (R=0.53, R^2=0.28, p<.05) between extraversion, agreeableness, neuroticism, openness to experience, and conscientiousness and adolescent career decision-

making self-efficacy. The sum of the five aforementioned variables explains around 28% of the variance explained in self-efficacy in career decision-making.

According to the standardized regression coefficient (β), the relative importance of the predictor variables on career decision-making self-efficacy is explored as; conscientiousness, extroversion, agreeableness, neuroticism, and openness to experience. Extraversion, agreeableness, neuroticism, openness to experience, and conscientiousness are significant predictors of career decision-making self-efficacy when the t-test results regarding the significance of the regression coefficients are assessed.

The neuroticism sub-dimension of personality traits was found to have a negative significant relationship with career decision-making self-efficacy. In other words, as neuroticism increases, so does self-efficacy in making career decisions. In addition, the sub-dimensions of extraversion, agreeableness, openness to experience, and conscientiousness were found to have a positive and significant link with the career decision-making self-efficacy. Extroversion, agreeableness, openness to experience, and conscientiousness are personality qualities that predict high self-efficacy expectations for career decision-making. There are studies on this topic that draw conclusions that are comparable in the literature. Penn (2016) discovered a positive and significant relationship between career decision-making self-efficacy and extraversion and conscientiousness, while neuroticism was found to have a negative significant relationship. Meanwhile Bailey (2002) identified positive and significant relationships between career decision-making self-efficacy and openness to experience, conscientiousness, and extroversion, he found no correlation between agreeableness and neuroticism. In another study, Chadick (2018) discovered a positive relationship between career decision-making self-efficacy and openness to experience, onscientiocusness, extroversion, and agreeableness; however, neuroticism was found to have a negative significant relationship. Sarçam (2013) found that self-efficacy perception and decision skills, which are quite similar to the competency expectation investigated in this study, can be useful in making career decisions. Individuals' career decision-making self-efficacy (Taylor & Betz, 1983) is directly related to their ability to fulfill and accomplish tasks related to job choice and commitment, according to self-efficacy expectation. According to studies on career decision self-efficacy (Bullock-Yowell, Andrews, & Buzzetta, 2011; Jin, Watkins, & Yuen, 2009; Wang et al., 2006), there was a positive and significant relationship between career decision self-efficacy and openness to experience, conscientiousness, extroversion, and agreeableness, while negative significant relationships were explained by neuroticism.

CONCLUSION

These findings can be considered to have some significance for adolescents' career decision-making, given the characteristics that influence self-efficacy and career anxiety in career decision-making. Although there are studies in the literature that show relationships between personality traits and career anxiety (Chamorro-Premuzic et al. 2008; Kayadibi, 2019; Vreeke & Muris, 2012) and career decision-making self-efficacy (Bailey, 2002; Chadick, 2018; Penn, 2016), the fact that this research revealed the relationship between career anxiety, career decision-making self-efficacy, and personality traits can be considered an important contribution. Significantly predicting career anxiety (12%) and career decision-making self-efficacy (28%) reveals that personality traits are important factors in the examination of career anxiety and career decision-making self-efficacy. In order to assist adolescents in making their career decisions, it is important to identify personality traits and take them into consideration in further studies. Even though there are studies on career decision-making self-efficacy or self-efficacy in the literature, further research that evaluate career anxiety and career decision-making self-efficacy in adolescents and their effects on career choice with various variables are recommended. Moreover, exploratory research into the determinants of career anxiety and self-efficacy in making career decisions may be valuable in highlighting the concerns that people face in this subject. Likewise, encouraging adolescents in the process of selecting a career to seek help from school counselors in order to explore their intellectual, emotional, and behavioral qualities as extensions of their personality traits can be facilitated. Thus, recognizing and supporting students' positive personality traits might help to reduce the anxiety they experience while making career decisions and increase their self-efficacy in making those decisions.

This study also has some important limitations. First and foremost, the participants were chosen using a convenient sampling method, which could restrict the generalizability of the study's findings. Additionally, the assessment methods adopted for the study require students to report about themselves, which provides a constraint in terms of influencing students' willingness to provide the expected responses. In particular, determination of personality traits based on adjectives, notably descriptive terms believed to reflect the participants' own personalities, may have revealed a skewed response tendency toward social acceptance.

DECLARATIONS

The authors have no competing interests to declare that are relevant to the content of this article. Approval was obtained from the ethics committee of TED University, Ankara. The procedures used in this study adhere to the tenets of the Declaration of Helsinki and verbal informed consent was obtained prior to the interviews while an informed consent was given by all participants who completed other forms used in this study. No funds, grants, or other support was received.

DATA AVAILABILITY

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Preservice Special Education Teachers'Attitudes Towards Assistive Technologies

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Article Info	ABSTRACT
	Considering that all teachers use technology intensively in educational environments, especially after the Covid-19 pandemic, special education teachers are also expected to integrate technology into their lessons effectively and efficiently in the future. Thus, this study aims to determine the attitudes of preservice special education teachers' towards assistive technologies. The data were collected in the 2020-2021 academic year. Participants were 240 special education students from various universities. The data collection tool was an attitude scale consisting of 4 dimensions and 18 items. Findings reported no significant difference in the attitudes towards assistive technologies regarding variables such as the duration of daily Internet use, grade level, and gender. However, a statistically significant difference was found in terms of variables such as the frequency of following technological developments and taking an assistive technology course. Based on scale mean scores, special education students have positive attitudes towards assistive technologies. Given that following the technological developments is effective in developing a positive attitude towards assistive technologies, special education students are recommended to closely follow current technological developments in future. It is considered that students who follow these technological developments will be more beneficial to students with special needs.

INTRODUCTION

Today, technology is inevitable in everyday life. The use of technology has become a necessity for every professional group. Teachership is one of these groups that require effective and efficient use of technology. Teachers work in environments where new generation technology is used intensively and continue to live in such a society (Balay, 2004). In particular, the adverse conditions created by the Covid-19 pandemic have led to the change, revision and restructuring of the education system, and the acceleration of hybrid environments. Researchers conducted many academic studies on hybrid learning in our country, especially in the last fifteen years (Hebebci & Usta, 2015). This recalls the famous quote of the American educational theorist John Dewey: "*If we teach today's students as we taught yesterday's, we rob them of tomorrow.*" Therefore, it is quite natural to expect teachers to use technology effectively, considering that the age we live in is the age of technology, and children born in this age are individuals who use technology for consumption or production purposes.

Many technologies applied within the scope of general education are also used in the field of special education (Aslan, 2018). These technologies, which are used in special education, are called *"assistive technologies"* (AT) in a general framework (Özdamar, 2016; Tekinarslan & Yıkmış, 2005). AT refers to technologies that aim to help individuals with special needs, improve their quality of life and enable them to function better (Lancioni et al., 2013). In fact, it is an umbrella term that covers many technology-based products and services (Murugaiyan & Arulsamy, 2013). Accordingly, all kinds of technologies, equipment, systems and products that facilitate, develop and sustain the daily life skills of individuals with special needs are defined as AT (Pettersson & Fahlstrom, 2010; Reed & Bowser, 2005).

One of the dimentions that have the most important role in the effective integration of AT into lessons or classroom environments is teachers. Teachers adopting AT, having positive attitudes towards AT and successfully integrating AT into their lessons will pave the way for their students with special needs to use AT effectively at school and in daily life. Therefore, teachers must have positive attitudes towards AT. In such a situation, the issue that comes to the fore or needs to be taken seriously is the teacher's attitude towards AT. Teachers' effective use of AT varies depending on their attitudes towards AT (Aslan, 2018). Therefore, their attitudes towards AT must be positive so that they can use AT effectively in the field of special education.

Various studies have examined AT, focusing on the following variables: individuals' knowledge levels of AT (Alkahtani, 2013; Campbell, 2000; Ledger, 1999; Maushak et al., 2001), their perceptions (Kim et al., 2003), their opinions about AT (Çiçek et al., 2013; Demirkıran, 2005; Özdamar, 2016; Özgüç & Cavkaytar, 2011), the need (Özel et al., 2004), effectiveness (Özgüç, 2015), and usage of AT (Arı & İnan, 2010; Çakmak et al., 2014). On the other hand, many studies have examined attitudes towards AT. The participants of these studies are mostly special education teachers (Aslan, 2018; Çay et al., 2020; Demirok et al., 2019; Guggenberger, 2008; Ledger, 1999; Maushak et al., 2001; Memet & Şentürk, 2021; Sertkaya, 2021), teachers working in the field of special education (Bahçeci, 2019; Chukwuemeka & Samaila, 2020; Eryiğit, 2021; Kutlu et al., 2018; Onivehu et al., 2017; Otr, 2000), and general education teachers (Garcia & Seevers, 2005). The common finding is the positive attitudes towards AT. However, there is a dearth of research examining special education students' attitudes towards AT. Karakoç & Aslan (2017) studied the attitudes of fourth-grade students studying special education towards AT and found positive attitudes. The present research recruited special education students as the study group. Determining the attitudes of special education students towards AT will contribute to the development of the education services they offer especially to students with special needs.

Attitude towards AT can be considered an important factor in planning classroom activities for special education teachers. Teacher's attitudes towards AT and integrating it into their lessons also play

an important role in the planning and teaching of the content (Maloy et al., 2016). Based on the importance of special education teachers' attitudes towards AT (Campbell, 2000), it is vital to identify pre-service teachers' attitudes towards AT as they will be future special education teachers. Considering the intense integration of technology into lessons and educational environments, especially after the pandemic period (Aşkan & Usta, 2022), it is crucial to underline special education students' attitudes towards AT. Therefore, there is a need for more studies investigating attitudes towards AT. This research aims to examine preservice special education teachers' attitudes towards AT. To achieve this goal, answers to the following research questions were sought:

1. Do preservice special education teachers' attitudes towards AT differ significantly according to gender?

2. Do preservice special education teachers' attitudes towards AT differ significantly according to grade level?

3. Do preservice special education teachers' attitudes towards AT differ significantly depending on whether they take AT courses or not?

4. Do preservice special education teachers' attitudes towards AT differ significantly according to daily Internet use?

5. Do preservice special education teachers' attitudes towards AT differ significantly according to the frequency of following technological developments?

METHOD

Research Design

This study adopted the survey model. The survey model helps determining the views of the participants or their characteristics such as interests, skills and attitudes regarding a subject (Büyüköztürk et al., 2012; Fraenkel, Wallen, & Hyun, 2012).

Participants

The participants were 240 preservice special education students studying during the 2020-2021 academic year. The student characteristics, such as gender, grade level, whether they took AT (Assistive Technology) course, daily Internet usage time, and frequency of following technological developments, were presented below.

Table 1. *Participants' characteristics*

Variables	Categories	f	%
Gender	Male	106	44.2
	Female	134	55.8
Grade Level	First-grade	57	23.7
	Second-grade	60	25.0
	Third-grade	63	26.3
	Fourth-grade	60	25.0
Took AT Course	Yes	148	61.7
	No	92	38.3
Daily Internet Usage Time	0-2 hour-usage	88	36.7
	3-5 hour-usage	86	35.8
	6-7 hour-usage	66	27.5
Frequency of Following Technological Developments	Never followed	34	14.2
	Occasionally	114	47.5
	Frequently	92	38.3

As can be seen in Table 1, 44.2% (n=106) of the students were boys and 55.8% (n=134) were girls. The distribution of the students according to their grade levels was similar: There were 57

(23.7%) first-grade students, 60 (25%) second-grade students, 63 (26.3%) third-grade students, and 60 (25%) fourth-grade students. While 61.7% (n=148) of the students took courses related to AT, 38.3% (n=92) did not. There were differences in students' daily Internet use: 88 (36.7%) students in 0-2 hour-usage category, 86 (35.8%) students in 3-5 hour-usage category, and 66 (27.5%) students in 6-7 hour-usage category. 34 (14.2%) students never followed technological developments, 114 (47.5%) students followed it occasionally, and 92 (38.3%) students followed it frequently.

Research Instruments and Processes

The data were collected through the Attitude Scale Towards Assistive Technologies developed by Aslan & Kan (2017) and the Personal Information Form. The scale consisted of 18 (13 positive, 5 negative) items, including 4 dimensions (behavioral, affective, cognitive, and negative emotion components). It was a 5-point Likert type: "1: Strongly disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Totally agree" The total lowest score was 18 points, and maximum 90 points could be obtained. Obtaining high scores indicated positive attitudes towards AT. The reliability values of the scale were .80 for the behavioral dimension; .83 for the affective dimension; .71 for the negative emotion dimension; and .79 for the cognitive dimension. The Cronbach Alpha reliability coefficient for the entire scale was .88. The Personal Information Form was used for demographic information of the participants, such as gender, grade level, whether they took AT courses, their daily Internet usage time, and the frequency of following technological developments.

The data were collected online by the researchers during the 2020-2021 academic year. The scale was converted into an online format. Then, the link of the scale was shared with students through their emails. Also, the link was shared in various e-mail groups and on social media of special education departments. The emails included the following information: Participants were asked to fill in the attitude scale, participation in the research was completely voluntary, the information to be obtained would only be used for scientific purposes, and the questionnaire should be filled in completely. The link was kept active for 21 days and then was closed to access. During this time, 240 participants filled in the scale. After this number was deemed sufficient by the researchers, the scale form was closed to access and the data collection process was terminated.

Data Analysis

Data were analyzed via the IBM SPSS Statistics 22 program. Frequency (f), percentage (%), and comparison tests were used. Data were first checked in terms of missing items and extreme value analysis. Then, the normal distribution of the data was examined, using Kolmogorov-Smirnov and Shapiro-Wilk results. Data showed normal distribution. Thus, a t-test was used for variables such as gender and whether they took AT courses. One-way analysis of variance (ANOVA) was used to analyze the variables such as grade level, daily Internet usage time and frequency of following technological developments. A Post-Hoc test was used to determine between which groups there were significant differences. The significance level was considered .05.

FINDINGS

Table 2 shows whether special education students' attitudes towards AT differ in terms of grade level, daily Internet use and frequency of following technological developments.

As can be seen in Table 2, the frequency of following technological developments caused a significant difference in students' attitudes towards AT ($F(2, 237) = 11.044$, $p < .05$). according to Post-hoc Tukey's HSD tests, this difference was between students who frequently followed technological developments and those who followed them occasionally or never followed them. In other words, the mean attitude score of the students who frequently followed technological developments ($M = 71.67$, $SD = 10.31$) were higher than the students who followed them occasionally ($M = 65.48$, $SD = 12.19$) and never followed them ($M = 62.64$, $SD = 11.37$).

Daily Internet usage time did not have a significant difference in students' attitudes towards AT

(F(2, 237) = 1.287, p > .05). Although the mean attitude scores of the students who use the Internet for 6-7 hours a day (M = 69.07, SD = 11.46) was higher than the students who use 0-2 hours (M = 66.01, SD = 11.92) and 3-5 (M = 67.68, SD = 12.05) hours, it was not statistically significant.

For grade level, students' attitude scores towards AT did not show a significant difference (F(2, 237) = 1.287, p > .05). They had similar mean scores.

Table 2. *ANOVA results in terms of frequency of following technological developments, daily internet usage time and grade level variables*

Variables	Categories	n	Mean	sd	F	p	Meaningful Relationship
Frequency of Following Technological Developments	Never followed	34	62.64	11.37	11.044	*.000*	Never followed-Frequently Occasionally- Frequently
	Occasionally	114	65.48	12.19			
	Frequently	92	71.67	10.31			
Daily Internet Usage Time	0-2 hour-usage	88	66.01	11.92	1.287	.278	-
	3-5 hour-usage	86	67.68	12.05			
	6-7 hour-usage	66	69.07	11.46			
Grade Level	First-grade	57	68.77	12.81	.529	.663	-
	Second-grade	60	67.18	11.37			
	Third-grade	63	66.12	11.13			
	Fourth-grade	60	67.86	12.27			

Table 3 presented the t-test results performed to determine whether there was a difference in terms of taking AT courses and gender.

Table 3 reported no statistically significant difference in students' attitudes towards AT in terms of gender variable (t238 = .272; p > .05). Female and male students had similar scores. On the other hand, a significant difference was found between students' attitude scores in terms of taking AT courses (t238 = 1.961; p < .05). This difference was in favor of students who took AT courses. In other words, students who took AT courses (M = 69.34, SD = 11.10) had higher mean scores than those who did not take (M = 66.27, SD = 12.19).

Table 3. *t-test results in terms of gender and at course taking variables*

Variables	Categories	n	X̄	sd	df	t	p
Gender	Male	106	67.68	11.75	238	.272	.786
	Female	134	67.26	11.98			
Took AT Course	Yes	148	69.34	11.10	238	1.961	*.046*
	No	92	66.27	12.19			

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This study focused on special education students' attitudes towards AT regarding variables such as gender, grade level, daily Internet usage time, taking AT courses, and frequency of following technological developments. While students' attitudes towards AT differed significantly according to some variables (e.g., the frequency of following technological developments and whether they took AT courses), no statistically significant difference was found in terms of daily Internet usage time, grade level, and gender. These findings were discussed within the scope of the literature and suggestions were made.

Findings reported positive attitudes towards AT, which confirms the literature. Karakoç & Aslan (2017) found that special education fourth-grade students had positive attitudes towards AT. Besides, it has been reported in various studies that special education teachers (Aslan, 2018; Çay et al., 2020; Demirok et al., 2019; Guggenberger, 2008; Ledger, 1999; Maushak et al., 2001; Memet & Şentürk, 2021; Sertkaya, 2021), teachers working in the field of special education (Bahçeci, 2019; Chukwuemeka & Samaila, 2020; Eryiğit, 2021; Kutlu et al., 2018; Onivehu et al., 2017; Otr, 2000), and general education teachers (Garcia & Seevers, 2005) have positive attitudes towards AT. Accordingly, this study shares similar results with the literature, which is important in terms of efficient and correct

use of AT. The proficiency of teachers or pre-service teachers in the field of technology and their positive attitude towards technology can affect the use of AT (Kışla, 2008). Teachers' positive attitudes play an important role in integrating AT into lessons, planning the content as well as transferring the content (Maloy et al., 2016). In this sense, positive attitudes towards AT can be considered an important factor in special education teachers' organizing in-class activities (Kim et al., 2003), motivating students with special needs, peer acceptance and productivity in the classroom (Quenneville, 2001), and increasing student success (Garcia & Seevers, 2005). Therefore, teachers and especially students need to develop positive attitudes towards AT. The present study indicates that these attitudes are positive.

Findings showed that students' attitudes towards AT were not statistically significant in terms of daily Internet usage time, grade level, and gender. In terms of gender, mean scores of students' attitudes towards AT were similar. Similarly, students had similar mean scores in terms of grade level. Regarding daily Internet usage time, although the average score of the students' attitudes towards AT was high in favor of the students the Internet for 6-7 hours a day, this high average was not statistically significant. Various studies support these findings. For example, some studies have shown that the gender variable does not have a significant effect on attitudes towards AT (Aslan, 2018; Demirkıran, 2005; Karakoç & Aslan, 2017; Memet & Şentürk, 2021; Murugaiyan & Arulsamy, 2013; Onivehu et al., 2017; Sertkaya, 2021). This emphasizes the similarities between this research and the literature. These findings can be interpreted that the gender variable does not affect the attitudes of special education students towards AT. In other words, it does not predict their attitudes. Contrary to these findings, some studies have stated that the gender factor differs in attitudes towards AT (Alhossein & Aldawood, 2017; Bahceci, 2019; Campbell, 2000; Eryiğit, 2021; Özdamar, 2016). It is thought that these differences are due to the sample groups or the data collection tools.

Considering grade level, special education students' attitudes towards AT did not differ. There are studies in the literature that support this finding. For example, Guggenberger (2008) stated that the grade level did not make a significant difference. Maushak et al. (2001) found no statistically significant difference depending on the grade level. Accordingly, it can be said that this study and the literature share similar findings. That is, the grade level does not predict special education students' attitudes towards AT. It can be concluded that there is no change in the attitudes of special education students towards AT, no matter whether the grade level increases or decreases.

Regarding the duration of daily Internet use, students' attitudes towards AT did not differ significantly. In other words, the duration of daily Internet use did not have a statistically significant difference in special education students' attitudes towards AT. Although the average of attitudes of students who used the Internet for 6-7 hours a day was higher than the students who used the Internet for 0-2 hours and 3-5 hours, it was not statistically significant. In fact, the AT attitude score was expected to be high in favor of students who used the Internet more. However, no such finding was reached. The differences occurred between the students using the Internet more and the students using the Internet relatively less. Therefore, no connection was established between the duration of Internet use and the attitude towards AT. It can be stated that the time spent on the Internet is not a predictor of students' attitudes towards AT. Hence, there was no significant change in attitudes towards AT, no matter whether the duration of Internet use increased or decreased. In fact, the lack of difference can be associated with the fact that students generally use the Internet in different areas such as doing homework, playing games, and social media. From this point of view, while the time spent on the Internet for various purposes increases, this does not make any difference to the attitudes towards AT.

Other findings were that special education students' attitudes towards AT differed according to the frequency of following technological developments and whether AT courses were taken. Regarding the frequency of following technological developments, the mean scores of special education students' attitudes towards AT differed statistically. The mean attitude score of the students who frequently followed technological developments was higher than the students who followed them occasionally and

never followed them. Bahceci (2019) stated that teachers who use websites for current developments in the field had significantly higher scores compared to those who did not. This indicates that following technological developments is effective in developing a positive attitude towards AT. In other words, students who follow technological developments may have had more knowledge, skills, or behaviors about AT. This may have contributed to their positive attitudes towards AT. Based on this finding, it can be recommended that teachers, professionals working in the field of special education, and families follow technological developments. Considering technological developments, popular tools such as phones and tablets and tools that can be useful for children with special needs should be followed. Another suggestion might be to prioritize educational technologies. Thus, a positive contribution can be made to their attitudes towards AT.

Another finding was that the attitude point averages of special education students differed in terms of taking AT courses. This difference was in favor of students who took AT courses. The averages of the students who took the AT courses were higher than the students who did not take them. This finding confirms the literature. Memet & Şentürk (2021) observed that special education teachers who received in-service training on AT had a more positive attitude than teachers who did not. Similarly, Eryiğit (2021) found that the attitudes of special education teachers who received in-service training on AT were more positive than those who did not. According to Bahceci (2019), those who consider their technology education level good have a more positive attitude towards the use of AT compared to those who consider their technology education level medium or insufficient. Aslan (2018) concluded that teachers who received training on AT had higher attitude scores compared to those who did not. Investigating special education fourth-grade students' attitudes towards AT, Karakoç & Aslan (2017) stated that the attitude scores of the students who took the course were high and the difference was found to be significant. Therefore, the findings of this study are consistent with the findings in the literature. It can be interpreted that attitudes towards AT are affected by whether the individual took AT courses and that students who take courses have higher attitude scores. Based on these findings, it can be said that increasing the level of technology education will positively improve students' attitudes towards AT.

Findings reported no significant difference in the attitude towards AT according to the duration of daily internet use, grade level, and gender, but there was a significant difference regarding the frequency of following technological developments and taking AT courses. The scale used in this study has four different dimensions: behavioral, affective, negative emotion, and cognitive components. Further studies can examine whether different demographic variables have any significicace in these dimensions. Besides, experimental research can be conducted to examine the development of attitudes towards AT. Given that taking AT courses causes differentiation, special education students can be provided with AT courses. In-service training can be arranged for teachers.

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Adaptation of the Good Teaching Scale into Turkish: Validity and Reliability Study

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Article Info	ABSTRACT
	This study aimed to adapt the "Good Teaching Scale" (GTS) developed by Alhija (2017) to Turkish and to test its validity and reliability. The original form of the scale consisted of 5 sub-dimensions and a total of 35 items. The study data were collected from 491 students who were enrolled in postgraduate programs at a higher education institution in Turkey. In order to adapt the scale to Turkish, the language validity was verified, and then Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed with the data collected from two different sample groups for the construct validity of the GTS-Turkish version. The Cronbach's Alpha and the composite reliability coefficient were calculated to test internal consistency reliability. Results of the EFA showed that the items of the GTS translated into Turkish were collected in a 5 sub-dimensional structure, as in the original scale which explained 59.25% of the total variance. The results of the CFA showed that the GTS had good fit indices for the five-factor model. The Cronbach Alpha reliability coefficient was found as .905, and the composite reliability value as .872. The Cronbach's Alpha reliability coefficients of sub-dimensions of GTS-Turkish version were found to vary between .796 and .841. Reliability and validity results indicate that the Good Teaching Scale-Turkish version, which consists of 35 items and five sub-dimensions, is a valid and reliable instrument for measuring university students' perceptions of good teaching and the perceived characteristics of good teaching in higher education.

INTRODUCTION

Although there has been research on the phenomenon of good teaching, initiatives on how teaching can be made better, more qualified and of higher quality and excellence have always attracted attention. There has been a growing interest in knowing what contributes to good teaching and how. What is meant by "excellence" in teaching? What is good or effective teaching? How can quality in teaching be defined? An extensive literature exists around these questions that seek to develop a common understanding of what constitutes goodness, excellence, effectiveness, or quality in teaching (Serbati et al., 2020). However, a clear and agreed-upon consensus on the definition and functionalization of these concepts has still not been achieved (Alhija, 2017; Serbati et al., 2020).

Recent years have witnessed dramatic changes in the nature of teaching. Participation rates in education are on the rise, which raises diversity in terms of both the programs offered and the student population. Classes cater to a wide variety of students who demand quality teaching. Therefore, educational institutions are more interested in improving teaching and increasing the quality of teaching than ever before (Biggs, 2011). As the definition of good teaching depends on characteristics such as the type of the subject, class size, student ability, and assessment practices, it may not be possible to achieve consensus on the definition. This is mostly due to the complex nature of teaching, the heterogeneity of approaches, and the need to discuss the role of educational institutions in society (Serbati et al., 2020). However, in order to make a definition of "good" teaching, it is necessary to suggest a point of view towards the phenomenon. For example, Brew (2013), who offers a perspective on good teaching, draws attention to the fact that good teaching can be achieved by integrating research and teaching practices. Brew notes that improving students' learning experiences can be achieved by promoting a culture of inquiry.

The Phenomenon of "Good" Teaching

In its broadest sense, the concept of teaching is categorized in two directions, namely teacher-centered/content-oriented and student-centered/learning-oriented. A teacher-centered/content-oriented approach perceives teaching as the transfer of knowledge (Kember & Kwan, 2000). Knowledge is seen as being transferred from an expert teacher to an inexperienced learner, and the task of the teacher is to pass the knowledge across (Biggs, 2012). The student-centered/learning-oriented approach, on the other hand, perceives teaching as facilitating learning (Kember & Kwan, 2000) and sees it as bringing about a conceptual change in students' understanding of the world. What matters is not what teachers do, but what students do to achieve understanding (Biggs, 2012). Therefore, the most important way to improve and make teaching effective is to shift the focus from the teacher to the student (Biggs, 2011).

In the phenomenon of good teaching, the concept of "good" refers to a teaching quality that is more than adequate, if not exceptional or excellent in most cases. "Good" is a scale point often used to indicate an expected level of performance in the learner's assessment. (Pratt, 2002). The quality of teaching is associated with learning outcomes. Therefore, good teaching supports and helps students learn at a high level of quality (Parpala & Lindblom-Ylänne, 2007). Good teaching focuses on the relationship between students' study processes and the structural aspects of their learning. Students' learning processes encompass three independent dimensions, each of which has a cognitive (strategic) and emotional (motivational) component. These are using, internalizing, and achieving (Biggs, 1979).

In a study they conducted, Marton and Säljö (1976, as cited in Biggs, 2012) gave students a text to read and informed them that they would be asked questions about this text. The students gave two different kinds of answers to the questions. The first group learned by anticipating questions, concentrating on the facts and details that could be asked, that is, they made a superficial attempt to learn. The second group, on the other hand, tried to understand what the author was trying to convey. In order to be able to make an interpretation, they went below the surface level of the text, i.e., they made a significant effort to learn. To achieve results, students may use learning activities that are cognitively

lower than necessary. This is a superficial attempt at learning. Alternatively, students can use appropriate high-level activities to achieve results, which is a deeper attempt at learning. Therefore, good teaching eliminates the aspects that encourage "superficial approaches" to learning and prepares students to use "deep learning" approaches more easily (Biggs, 2012; Kember & Kwan, 2000).

Good teaching can be explained by associating it with individual differences among students. In other words, the active participation of students in the learning process differs from their academic orientation and commitment to learning. Therefore, good teaching is to enable other students to use the cognitive processes (questioning, estimating, producing solutions, etc.) that students with more academic goals spontaneously use to achieve the intended learning outcomes (Biggs, 2011). This can be achieved by improving students' social skills, including their ability to answer questions about a particular field and solve problems, enabling their active participation in the lesson, including taking an interest and having fun, obeying classroom rules, and behaving pro-socially in the classroom (Jacob et al., 2017).

On the other hand, the different perspectives developed on teaching provide a framework for what good teaching could be. (1) In the transmission perspective, the function of teaching is to efficiently and effectively convey to students the knowledge and ways of thinking in the text or in the teacher. (2) In the developmental perspective, teachers should know how their students think about content or study and what they believe. Thus, students' ways of thinking can be transformed into better and more complex ways of thinking and reasoning. (3) In the nurturing perspective lies the belief that when the student's self-concept is threatened or diminished in any way, learning will be hindered, diverted, or completely stopped. Therefore, the desired learning outcomes can be achieved by learners who believe in the power of their own actions and are self-confident. An environment of care and trust must be created in teaching. (4) In the social reform perspective, the ultimate goal of teaching is to bring about social change rather than just individual learning. The object of change is collective rather than individual. Teaching is seen as a tool for social change (Pratt, 2002). In this respect, in order for good teaching to take place, teachers should provide cognitive challenges, monitor learning processes, offer individual help, manage time and organize the learning process effectively (Jacob et al., 2017).

Another issue related to the phenomenon at hand is the dimensions of good teaching. The first of these is the dimension of "teaching practice". In this dimension, what is at the center of teaching is to develop students' expertise in the subject, to implement interaction, and to provide diversity in teaching methods. The second is the dimension of the "teacher's role," in which it is important to inspire students and be an expert in one's field. Thirdly, in the dimension of "student's role", the student should be motivated to learn and actively process the information in his/her mind. Other dimensions are the educational context (students' learning basic knowledge and skills), the atmosphere (a classroom climate that encourages students to ask questions), and the physical environment (Parpala & Lindblom-Ylänne, 2007). At this point, student and teacher dimensions in good teaching should conceptually match each other. Providing a cognitively active education (teaching input) should result in students' academic skills attaining desired levels (learning output) while managing the classroom effectively (teaching input) should result in students' appropriate social behavior (learning output); also, providing a supportive climate (teaching input) should encourage positive teacher-student relationships (learning output) (Jacob et al., 2017).

What can be called "good" teaching is not dominated by a single view of learning or teaching (Pratt, 2002). As a matter of fact, the phenomenon of teaching can be explained using qualitatively different approaches. Some of these approaches are: the teacher-centered approach, which aims to convey information to students; the teacher/student interactive approach, which aims to have students acquire the concepts of the discipline, and the student-centered approach, which aims for a conceptual change in the students. As we progress from the first approach to the last approach, qualitative differences are observed in the learning processes. For example, the first approach is teacher-centered

and aims to transfer knowledge in the learning process, whereas the last approach is student-centered and focuses on a conceptual change in the learning process. What the student does and learns is more important than what the teacher does or teaches. Self-learning is encouraged in good teaching (Trigwell et al., 1999). Therefore, good teaching should be creative, student-centered, encouraging, interesting, adaptable, and compelling (Ruzgar, 2021). On the other hand, Chickering and Gamson (1987), who examined research on teaching and learning, drew attention to the principles to be considered in good teaching practices. According to them, good teaching should develop cooperation among students, cover different abilities and learning styles, encourage contact between students and teachers, promote active learning, provide quick feedback, complete teaching tasks in good time, and meet high expectations.

The Current Study

Another important issue with good teaching is how to adequately measure what is defined as "good" (Devine et al., 2013). The measurement procedures involve observing a quality and describing the observation result (Turgut, 1983). In teaching, measurement is used to determine the extent to which a program, application, or student possesses a particular quality or feature (Kan, 2007). During teaching, problems may arise due to the program, the physical, psychological, or social environment of the learning environment, teaching methods, or the profiles of the students. These problems should not be ignored in order for the teaching to be implemented in a "good" manner, and the understanding of solving problems by following the examples provided should be abandoned. Realistic determinations should be made about the problems, and new and progressive solutions should be developed. At this point, the most important factor in solving problems is detecting the problems correctly and revealing them. Therefore, it is important to measure the quality, standard, or effectiveness of teaching practices in an education that is defined as "good" (Yılmaz, 1998). In order to increase the standard, excellence or quality in teaching, there is a need for research to determine the basic criteria that form the essence of "good" teaching. Determining these criteria will contribute to the development of curricula, the organization of learning-teaching activities, the evaluation of learning outcomes, the improvement of learning environments, and student development.

When the relevant literature is examined, a great majority of previous research has been conducted on the subject of "good" teaching, which can be associated with different concepts such as effective teaching, quality in teaching, and excellence in teaching (Biggs, 2011; Brew, 2013; Chickering & Gamson, 1987; Devine et al., 2013; Jacob et al., 2017; Parpala and Lindblom-Ylänne, 2007; Pratt, 2002; Serbati et al., 2020). Likewise, various assessment tools are seen in the related literature for measuring perceptions, attitudes, or practices towards good teaching (e.g., Alhija, 2017; Roy et al., 2013). When the national literature is examined, on the other hand, only a few scale development studies are observed that measure the affective awareness levels of university students about teaching (Duman & Yakar, 2017), the use of effective teaching strategies by teachers (Cücük et al., 2018), the teaching competencies of instructors (Doğanay et al., 2021) and the teaching skills of classroom teachers (Kandemir & Kıran, 2021). These studies are assessment tools that measure awareness about teaching and the teaching competencies or skills of the instructors who perform the teaching. However, no assessment tool has been found in the national literature that measures the perceived characteristics of good teaching. Therefore, the fact that there is not yet an assessment tool in the national literature to measure different aspects such as the quality, standard, or effectiveness of good teaching can give an idea about the importance and justification of this study. In this context, the aim of this research is to adapt the Good Teaching Scale developed by Alhija (2017) to Turkish. The scale measures perceptions about the multifaceted nature of good teaching, including the sub-dimensions of "goals to be achieved", "long-term student development", "teaching methods", "relations with students", and "assessment qualities."

METHOD

Research Design

In this study, which was carried out with the quantitative survey method, the Good Teaching Scale developed by Alhija (2017) was adapted to Turkish. Quantitative survey research is used to collect data from a large number of respondents about an object of exploration (Filipov, 2019). The quantitative survey research is considered as a primary method to administer and evaluate the new instrument or instruments (May, 2001).

Research Sample

The population of the study consists of 1419 postgraduate students enrolled in the field of education sciences in a higher education institution in Turkey. The sample included a total of 491 postgraduate students, 270 male (54.98 %) and 221 female (45.01 %) currently enrolled in the fields of curriculum and instruction, primary school education, preschool education, psychological counseling and guidance, and educational administration during the 2021-2022 academic year. The convenience sampling method was used in the selection of the participants. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted for the construct validity of the Good Teaching Scale. EFA and CFA were performed with the data collected from two different samples.

The First Sample

The first sample, in which EFA was conducted, was selected from 285 postgraduate students who were studying in an education program at a higher education institution. Of the participants, 153 (53.68 %) were male and 132 (46.31 %) were female.

The Second Sample

The second sample, in which CFA was performed for the construct validity of the Good Teaching Scale, consisted of a total of 206 postgraduate students enrolled in a higher education, of whom 108 were male (52.42 %) and 98 (47.58 %) were female.

Instrument

The Good Teaching Scale

The Good Teaching Scale (GTS) was developed by Alhija (2017) to measure the good teaching perceptions of students studying in higher education or educators working in educational institutions. In order to ensure the validity of the scale, Alhija piloted the assessment tool on a sample group of 25 students studying at a higher education institution. The original scale includes items that set the perceptions of good teaching behaviors and consists of 35 items in total. All of the statements on the scale are positive, and there is no reverse-scored item on the scale. The items are grouped under 5 sub-dimensions representing various aspects of good teaching. These dimensions are (1) "goals to be achieved" (5 items), (2) "long-term student development" (8 items), (3) "teaching methods" (14 items), (4) "relations with students" (4 items) and (5) "assessment qualities" (4 items). The scope of the scale is based on the relevant literature on different aspects of good teaching. On the scale, the participants are asked to rate the relative importance they attach to each item on a 5-point Likert-type scale as "1=Of least importance", "2=Of low importance", "3=Of moderate importance", "4=Of high importance" and "5=Of highest importance". The scores that can be obtained from the scale vary between 35 and 175. The scale yields scores for the total score (perception of good teaching) and sub-dimensions. The higher the score, the higher the degree of perceptions regarding the characteristics of good teaching. An increase in the scores obtained from the dimensions in the GTS shows that the perception of the related dimension is higher.

The factor structure of the original GTS was tested with CFA by Alhija, who had developed the instrument. The results of the CFA confirmed the 5-factor model of the scale [(χ^2 = 1632.98, sd = 1430,

p< .05), CFI = .94, GFI = .95, SRMR =.050, RMSEA = .040). The CFA results showed that the scale validated the factor structure of good teaching as conceptualized, and was consistent with good teaching ideas defined in the relevant literature (Alhija, 2017; Biggs, 2011). The factor loadings of the items of the original scale ranged from .34 to .78. In addition, it was determined that the correlations between the dimensions of the GTS were positively correlated and between moderate and high levels p<.01.

Table 1. *Factors (Sub-dimensions), items, and cronbach alpha coefficients of the original Good Teaching Scale*

Sub-Dimension (Factor)	Items	Cronbach's Alpha
1. Goals to be achieved	1, 2, 3, 4, 5	.61
2. Long-term student development	6, 7, 8, 9, 10, 11, 12, 13	.82
3. Teaching methods	14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27	.82
4. Relations with students	28, 29, 30, 31	.74
5. Assessment qualities	32, 33, 34, 35	.68

In Table 1, the sub-dimensions of the original scale, the items in each dimension, and the Cronbach's Alpha (internal consistency) reliability coefficients for these dimensions are given. The Cronbach's Alpha obtained in the analysis of the reliability of the scale was found to be .61 for the "goals to be achieved" dimension, .82 for the "long-term student development" dimension, .82 for the "teaching methods" dimension, .74 for the "relations with students" dimension and .68 for the "assessment qualities" dimension (Alhija, 2017).

Obtainment of permission to adapt the scale

Dr. Fadia Nasser-Abu Alhija, who had developed the original scale, was contacted via e-mail in order to adapt the GTS to Turkish. The adaptation process was initiated after receiving Alhija's e-mail that confirmed and welcomed the adaptation of the scale into Turkish.

Data collection

Data of this study were collected from participants in the classroom setting in the spring semester of the 2021-2022 academic year. The administration of the instrument took place in a time period of 5-10 minutes. All study data were included in the process of analysis, because there were no missing ones among the data collected from a total of 491 participants.

Adaptation of the scale to Turkish

The process of the GTS adaptation consists of the following steps: 1) obtaining the permission to adapt the scale from the author who developed the scale, 2) adapting the scale to the target language, 3) piloting the adapted scale, 4) conducting the validity analysis of the adapted scale, and 5) performing the reliability analysis of the adapted scale. "Translation" and "adaptation," two concepts that are often confused in literature, are different from each other. Translation is only one of the stages in the adaptation process and includes linguistic conversion from one language to another. Adaptation is a much more comprehensive concept and requires consideration of the cultural, psychological, and linguistic differences of the scale to be adapted (International Test Commission [ITC], 2018). In this study, two methods in the literature were used in the process of adapting to Turkish the Good Teaching Scale, whose original form was in English, in terms of cultural and linguistic characteristics. The first is "forward translation" and the second is "back translation" (Durak & Karagöz, 2021).

Forward translation of the scale

At this stage, the original scale is translated from the source language to the target language by at least two experts who know both the source language and the target language. Then these translations are compared and a form is created to reflect a common opinion. In this context, all the items of the English form of the original GTS instrument were translated into Turkish by five faculty members who worked in the departments of English language education, testing and evaluation, curricula and

teaching, guidance and psychological counseling, and social sciences education and knew the English language at an advanced level. A common Turkish form was created by comparing the scale items obtained from these experts.

Back Translation of the Scale

Next, the items of the scale translated into the target language are translated into the original language of the scale by other translators, and these translations are compared to obtain a form in the original language that reflects the translators' consensus. Then, the similarity of the scales is checked by comparing this form, obtained by the back translation method in the original language, with the scale form in the original language. In this respect, the Good Teaching Scale, which was translated into Turkish, was given to another group of three people who had a sound knowledge of English, and these experts were asked to translate the scale from Turkish into English, the original language of the scale. Then, the original expressions of each item and the expressions resulting from this translation were compared one-to-one. As a result of the comparison, it was found that the translation and the original scale were generally equivalent to each other, and thus the translation process was completed. Finally, the obtained scale items of the Turkish version were examined by two experts in the field of Turkish education in terms of intelligibility, meaningfulness, and clarity, and in this way, the scale was given its final form.

Pilot Study of the Adapted Scale

After the translation procedures, English and Turkish forms were administered to 30 currently undergraduate students studying in the English language teaching department at a higher education institution in order to determine the linguistic equivalence of the Good Teaching Scale and the clarity of its items. Moreover, the statement "If there are any items that you have difficulty understanding, please specify" was added to the end of the scale forms in order to receive feedback on the intelligibility of the translations and to identify the problematic items. As a result of the feedback, it was found that the items translated into Turkish provided clear instructions for the participants and defined the perception of good teaching. In addition, the correlation analysis that was conducted revealed a positive correlation between the original form and the adapted form of the GTS (r=.74, p<.001). Thus, the Turkish form of the 35-item scale was created, which was prepared to test the psychometric properties of the scale through the actual application (Appendix-1).

Data Analysis

In the study, the construct validity, item discrimination, and reliability of the data collected from the Good Teaching Scale form adapted to Turkish were tested within the framework of its psychometric properties. An EFA was conducted to ensure the construct validity of the Good Teaching Scale, which was adapted to Turkish. EFA analysis was performed with the SPSS program. On the other hand, CFA was performed to examine the similarity of the factor structure of the Turkish version of the scale with the factor structure of the original scale. The AMOS program was used for CFA, and the fit of the model that emerged in EFA was tested. In order to evaluate this fit, goodness of fit indices such as chi-square (χ^2), Goodness of Fit Index (GFI), Incremental Fit Index (IFI), Comparative Fit Index (CFI) and Root-Mean-Square Error of Approximation (RMSEA) were examined (Brown, 2006; Schermelleh-Engel et al., 2003). To determine the reliability of the scale, Cronbach's Alpha coefficient, composite reliability (CR) coefficient, and item-total correlation were performed. In order to measure to what extent the items were able to represent the scale, item-total correlation scores were determined at the sub-dimensions level. In addition, the scores of the lower 27 % and upper 27 % groups were compared to test item discrimination.

Ethics

This study was conducted in accordance with the ethics committee decision dated 08.04.2022 and numbered 2022/146 of the Social Sciences and Humanities Scientific Research Ethics Committee of the University of Necmettin Erbakan.

FINDINGS

Validity Study

Exploratory Factor Analysis (EFA)

Principal component analysis and Varimax technique were used in Exploratory Factor Analysis (EFA). The Kaiser-Meyer Olkin (KMO) value and the Bartlett Test of Sphericity (Alpar, 2010; Çokluk et al., 2010) were used to determine the fit of the data set for factor analysis before the EFA. For this purpose, KMO and Bartlett sphericity tests were performed. It is recommended that the KMO test be above .60 and close to 1 and that the Bartlett sphericity test be significant for the adequacy of the sample size. According to the results of the analysis, the KMO value of the scale was found to be .79 and the Bartlett sphericity test result was found to be significant ($\chi2 = 6362.336$, sd = 253, p< .001). In the light of these results, it can be stated that the data set is fit. In the EFA, the lower limit of the factor loads of the items was taken as .32 in line with the relevant literature (Büyüköztürk, 2014). In factor analysis, factors with an eigenvalue above 1 were accepted as the basis (Tabachnick et al., 2007).

Factor analysis result showed that the Good Teaching Scale had a 5-dimensional structure with an eigenvalue above 1 for 35 items, as in its original form. These five dimensions explained 59.25 % of the total variance. Researchers state that when the variance explained is between 40 % to 60 % in multi-factor designs, it is sufficient in the field of social sciences (Çokluk et al., 2010; Tavşancıl, 2014). Accordingly, the variance rate determined here is a sufficient rate for multi-factor designs. A total variance was explained by the first dimension with a rate of 42.03 %, by the second sub-dimension with 21.65 %, by the third sub-dimension with 15.53 %, by the fourth sub-dimension with 11.12 % and by the fifth sub-dimension with 8.25 %. It was found that the factor loads of all the items in the scale ranged from .45 to .81. The five dimensions in the scale explained 58.7 % of the total variance. Table 2 shows the EFA results, factor loading values of the items and common variances.

Table 2. *Results of the factor analysis of the Good Teaching Scale of Turkish version*

Item	Dimension					Common Variance
	Factor Loads					
	1	**2**	**3**	**4**	**5**	
Item 1	.770					.617
Item 2	.670					.481
Item 3	.815					.504
Item 4	.737					.677
Item 5	.803					.712
Item 6		.494				.716
Item 7		.558				.745
Item 8		.608				.664
Item 9		.511				.565
Item 10		.506				.686
Item 11		.741				.589
Item 12		.587				.593
Item 13		.552				.551
Item 14			.666			.756
Item 15			.585			.689
Item 16			.533			.612
Item 17			.499			.554
Item 18			.457			.666

Item 19	.426			.548
Item 20	.541			.717
Item 21	.603			.736
Item 22	.516			.748
Item 23	.594			.751
Item 24	.558			.632
Item 25	.478			.745
Item 26	.512			.777
Item 27	.633			.632
Item 28		.491		.528
Item 29		.524		.705
Item 30		.487		.647
Item 31		.543		.533
Item 32			.458	.669
Item 33			.585	.586
Item 34			.614	.548
Item 35			.547	.554

Table 2 shows that the Turkish version of the GTS instrument consists of 35 items and 5 dimensions. The structure obtained from the Turkish form as a result of the factor analysis is similar to the structure in the original form of the scale. The first sub-dimension of the scale ("goals to be achieved") consists of items 1, 2, 3, 4 and 5. The factor loads of these items range from .53 to .67. The second sub-dimension (long-term student development) consists of items 6, 7, 8, 9, 10, 11, 12 and 13. The factor loads of these items range from .42 to .66. The third sub-dimension (teaching methods) consists of items 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27. The factor loads of the items in this dimension are between .75 and .53. The fourth sub-dimension (relations with students) consists of items 27, 28, 29, 30 and 31. The factor loads of these items vary between .55 and .66. Finally, the fifth sub-dimension ("assessment qualities") consists of items 32, 33, 34 and 35. It was found that the factor loads of the items in this dimension are between .75 and .53.

Confirmatory Factor Analysis (CFA)

The Confirmatory Factor Analysis (CFA) was performed in order to test, in the context of model fit indices, the suitability of the 5-factor structure of the GTS, which emerged as a result of EFA, and the results of the analysis were compared with fit indices and limit values. As the confirmatory factor analysis data set met the multivariate normal distribution assumption, it was performed using the maximum likelihood method (Meydan & Şeşen, 2011). CFA was conducted on the second sample of the study. CFA analysis was performed by using the AMOS program. The CFA results, which consisted of 35 items and 5 sub-dimensions, revealed that the χ^2 value (233.5147, p < .001) was significant and the χ^2/sd ratio (2.379) was lower than 5, but other fit indices (GFI = .86, IFI = .87, CFI = .88, RMSEA = .077, SRMR = .072) were not within acceptable limits (Hu & Bentler, 1999; Kline, 2011; Schermelleh-Engel et al., 2003), so it was decided that the scale did not have an acceptable fit level in its current form. For this reason, modification indices were examined among the items that were thought to contribute significantly to the model fit in order to improve the model. The error terms (error covariances) of the 11th and 12th items (e11 <--> e12) and 18th and 19th (e18 <--> e19) were modified in line with the suggestions for modification. Both modifications were made on items of the same dimension and assumed to measure similar phenomena. The results of CFA repeated after the modifications showed that the model goodness of fit indices (χ^2/sd = 1.98; IFI= .92; CFI= .93; RMSEA= .058; GFI= .92; SRMR= .061) were within the acceptable goodness of fit limits (Kline, 2011; Schermelleh-Engel et al., 2003). It was found that the modifications contributed significantly to χ^2. Confirmatory factor analyses indicated that 35 items with five factors were valid for the Turkish higher education school sample. The standardized regression loads for the model were found to be significant and ranged from .49 to .81 (p< .01). These values indicate that the items of the scale are a suitable

representative of the measured dimensions. The path diagram of the CFA for the construct validity of the Good Teaching Scale of Turkish form is given in Figure 1.
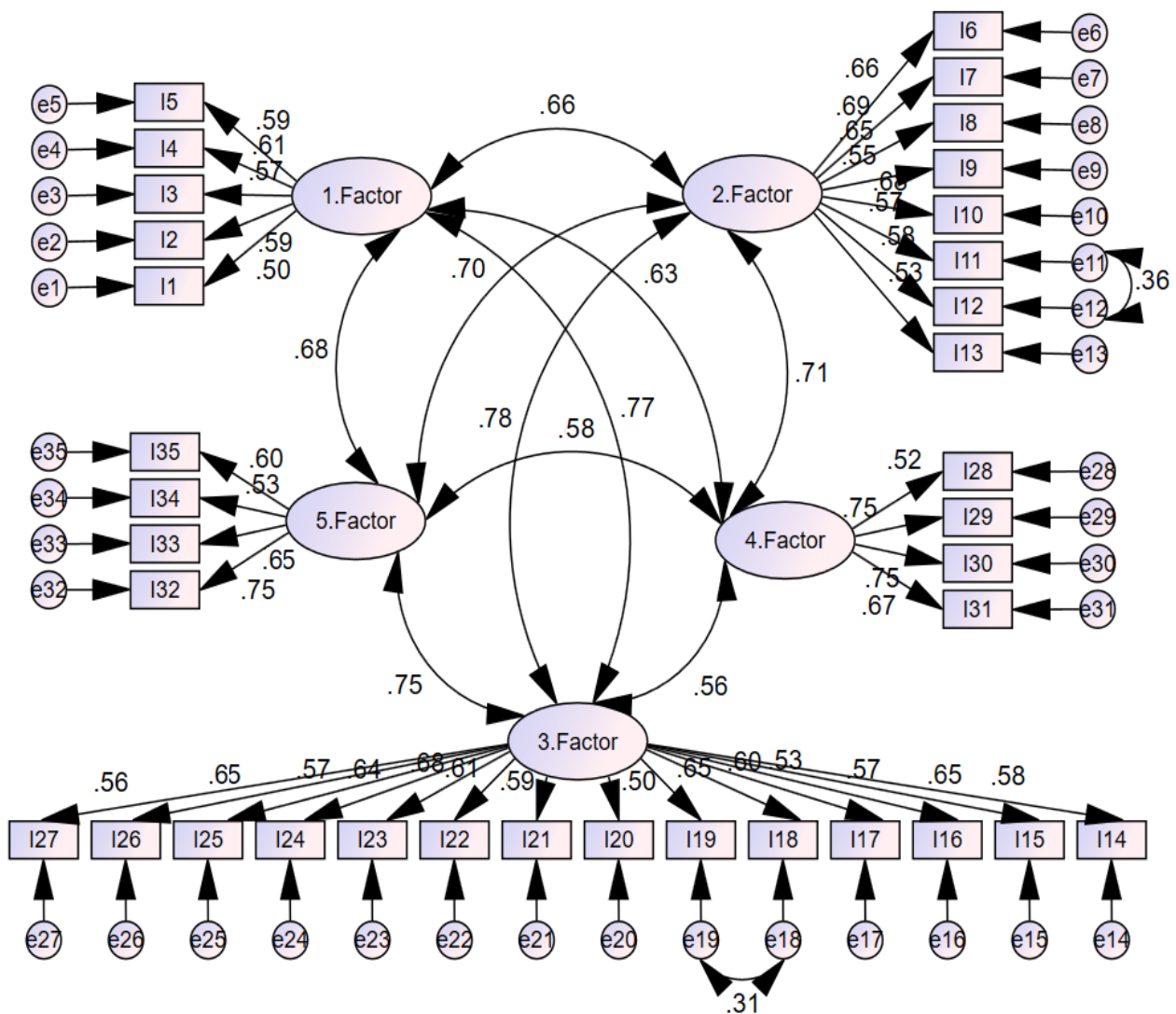
Figure 1. *Path diagram of the confirmatory factor analysis of the Good Teaching Scale of Turkish Version*

Findings Regarding Item Validity

Item-total correlations

Corrected item-total correlations were examined for item analysis of the GTS-Turkish form. The item-total correlation was examined to predict the sub-dimension total scores of the items in the GTS. In addition, independent sample t-test was performed between the lower group 27 % and the upper group 27 % scores regarding item discrimination. In Table 3, the item-total correlations of the scale and the t-test results regarding the difference between the lower 27 % and the upper group 27 % scores are given.

Table 3. *T-test values for the item-total correlation of the scale and the difference between the scores of the lower 27% and upper 27% groups*

Factor	Item	Item-Total Correlations	T (Lower 27 % And Upper 27 % Groups)
Goals to be achieved	Item 1	.65	23.35*
	Item 2	.77	37.45*
	Item 3	.60	24.01*
	Item 4	.71	28.60*
	Item 5	.60	29.89*
Long-term student development	Item 6	.54	25.22*
	Item 7	.70	17.44*
	Item 8	.76	12.56*
	Item 9	.63	18.74*
	Item 10	.51	26.74*
	Item 11	.72	17.50*
	Item 12	.60	26.85*
	Item 13	.68	21.20*
Teaching methods	Item 14	.67	14.56*
	Item 15	.62	32.01*
	Item 16	.44	18.85*
	Item 17	.69	21.55*
	Item 18	.72	25.45*
	Item 19	.60	20.81*
	Item 20	.75	22.60*
	Item 21	.65	19.89*
	Item 22	.59	17.22*
	Item 23	.67	29.44*
	Item 24	.72	23.56*
	Item 25	.67	26.19*
	Item 26	.56	19.89*
	Item 27	.71	31.57*
Relations with students	Item 28	.73	26.85*
	Item 29	.61	14.20*
	Item 30	.57	24.55*
	Item 31	.65	24.14*
Assessment qualities	Item 32	.70	33.85*
	Item 33	.64	23.45*
	Item 34	.72	10.42*
	Item 35	.55	22.99*

*$p<.05$

As seen in Table 3, the item-total correlations of the items in the scale ranged from .44 to .77. Researchers noted that an item-total score correlation coefficient of .30 and above indicates that the items have a good level of discrimination. Therefore, items can exemplify similar behaviors (Büyüköztürk, 2014; Field, 2005; Nunnally & Bernstein, 1994). The total scores obtained in the 5 dimensions of the scale and the item-total correlations between the items of the scale were between .60 and .77 in the first dimension (goals to be achieved), between .51 and .72 in the second dimension (long-term student development), between .44 and .75 in the third dimension (teaching methods), between .57 and .73 in the fourth dimension (relations with students), and between .55 and .72 in the fifth dimension (assessment qualities). The results suggest that items in the GTS-Turkish form have item consistency.

Discrimination Features of Items

In the scales formed by a multidimensional structure, it is necessary to determine the lower and upper groups for each dimension. As a result of this determination, the average item scores in the dimensions should be compared (Büyüköztürk, 2014). According to the results of the t-test analysis conducted to see the significance of the differences between the total scores of the lower 27 % and upper 27% groups for all items in the GTS, it was determined that there was a statistically significant difference between the lower and upper groups (p< .01). This significant difference shows that all the items in the scale have the desired level of discrimination of items in the scale (Erkuş, 2014). In addition, the correlation values between the sub-dimensions of GTS-Turkish form were also calculated. First, it was checked whether the values obtained from the data were in a normal distribution. Kurtosis and skewness values were examined. The kurtosis and skewness values of the sub-dimensions of the scale were: -.296, -.478 for the "goals to be achieved" sub-dimension; -.901, .369 for the "long-term student development" sub-dimension; -.729, -.413, for the "teaching methods" sub-dimension; -.113, .396 for the "relations with students" sub-dimension; -.545, -.389, for the "assessment qualities" dimension, and -.2131, -.678 for the total scale, respectively. As these values are between -1.5 and +1.5, they indicate that the variables have a normal distribution (Tabachnick et al., 2007). Results of the correlation analysis are given in Table 4.

Table 4. *Correlations between the factor scores of the Good Teaching Scale*

Factor	1	2	3	4	5
1. Goals to be achieved	-				
2. Long-term student development	.625**	-			
3. Teaching methods	.603**	.701**	-		
4. Relations with students	.512**	.587**	.707**	-	
5. Assessment qualities	.519**	.577**	.664**	.603**	-

**p< .01

As seen in Table 4, there is a positive correlation between the sub-dimensions of GTS-Turkish form. All correlation coefficients are significant at the p<.01 level. The correlations between the sub-dimensions of the scale show that it exhibits the multifaceted nature of good teaching and significantly confirms the relationships between the sub-dimensions of good teaching.

Reliability Analysis

The Cronbach alpha internal consistency coefficient and the composite reliability (CR) coefficient were calculated to provide evidence for the reliability of the scores obtained from the Good Teaching Scale adapted to Turkish. Field (2005) states that the most widely used internal consistency coefficient for scales is Cronbach's Alpha. The Alpha coefficients and composite reliability (CR) coefficients for both the whole of the scale and the sub-dimensions are given in Table 5.

Table 5. *The reliability coefficient of the scale and its sub-dimensions*

Factor	Cronbach's Alfa	Composite Reliability
Goals to be achieved	.817	.854
Long-term student development	.838	.806
Teaching methods	.796	.822
Relations with students	.841	.841
Assessment qualities	.805	.799
Total	.905	.872

The Cronbach's Alpha coefficient for the sub-dimensions of the scale is .817 in the first sub-dimension (goals to be achieved), .838 in the second sub-dimension (long-term student development), .796 in the third sub-dimension (teaching methods), .841 in the fourth sub-dimension (relations with students), and .805 in the fifth dimension (assessment qualities t). It is seen in the calculation made for the whole of the scale that the Cronbach's Alpha internal consistency coefficient is ,905. The composite reliability values for the sub-dimensions are; .854 (goals to be achieved), .806 (long-term student development), .822 (teaching methods), .841 (relations with students), .799 (assessment qualities), and .872 (the whole scale), respectively. These values are above the .70 value accepted in the literature (Driver & Maslakçı, 2020; Hair et al., 2010). When the coefficients related to reliability are evaluated together, it can be concluded that the GTS-Turkish version has good internal consistency and is reliable.

DISCUSSION, CONCLUSION AND SUGGESTIONS

In this study, the validity and reliability calculations were made of the Turkish-adapted version of the Good Teaching Scale developed by Alhija (2017), which measures higher education students' perceptions of good teaching. An adaptation study was conducted using all the items in the original scale. The original form of the scale consists of five sub-dimensions and 35 items: "goals to be achieved", "long-term student development", "teaching methods", "relations with students" and "assessment qualities".

In the study, the Good Teaching Scale was adapted to Turkish, taking into account the framework recommended by ITC (2018). First, a language equivalence study was performed within the scope of adaptation of the original scale to Turkish. The scale was translated into Turkish by experts in the field of English language. The resulting Turkish form was translated back into English and expert opinion was obtained. As a result of the adaptation studies, the equivalence of the Turkish and English forms of the scale was confirmed. EFA and CFA were conducted to obtain evidence for the construct validity of the scale, which was adapted to Turkish after language equivalence studies. As a result of the EFA, a 5-factor construct was obtained, explaining 59.25 % of the total variance, as in the original construct of the scale. There are different opinions about the variance ratio explained in the literature. While Büyüköztürk (2014) stated that the explained variance rate should be at least 30 %, Scherer et al. (1988) defined values of 40 % and above as acceptable for the explained variance. Accordingly, it can be said that the rate of explained variance obtained as a result of this study is good. The EFA results showed that factor loads of all the items of the scale were above the baseline limit of .32 (Tabachnick et al., 2007).

In order to test the factor structure defined in the scale as a result of EFA, CFA was performed and according to the results obtained, it was determined that the model fit indices were not sufficient. It was tried to improve the fit indices with the covariance connections in accordance with the modification suggestions. According to the results of the renewed CFA, the fit indices were at an acceptable level. Thus, the CFA results of the fit indices supported the 5-factor structure obtained from the EFA results. Corrected item-total correlations were examined for item consistency of the scale and it was seen that the values obtained were between .43 and .73. This finding showed that each item had a value in the desired range and was at an acceptable level (Streniner et al., 2015). In order to determine whether the items in the scale measured the characteristics that were intended to be measured, item-total score

correlations and the mean scores obtained from the upper 27 % and lower 27 % groups were calculated, and these values were compared (Büyüköztürk et al., 2015). The differences between the means of the lower and upper 27 % groups of the scale were found to be statistically significant. This result shows that the items in the scale have the desired discrimination level (Erkuş, 2014). The item-total score correlations range from .44 to .77. According to these values, it can be said that the power of the items to represent the scale is sufficient (Büyüköztürk, 2014). It was determined that the correlation values between the scale factors were in the range of .512 and .707 and there were positive and significant (p<.01) correlations between the sub-dimensions (Pallant, 2013). According to experts, the correlation values between the scale sub-dimensions should be below .90 in order to avoid multiple correlation problems among the scale sub-dimensions. (Field, 2005; Kline, 2011; Tabachnick et al., 2007). Therefore, it can be said that such a situation did not exist among the scale factors.

The reliability of the scale adapted to Turkish was tried to be determined by calculating the Cronbach's alpha coefficient and the composite reliability coefficient. The Cronbach's alpha (internal consistency) coefficient for the entire Turkish version of the scale was found to be .905. The Cronbach's alpha coefficients of the sub-dimensions were .817 for the first sub-dimension; .838 for the second sub-dimension; .796 for the third sub-dimension, .841 for the fourth dimension and .805 for the fifth dimension. In addition, the composite reliability values of the sub-dimensions in the scale were above .70. In the literature, it is recommended that the internal consistency coefficient be above .70 (Büyüköztürk, 2014). A reliability coefficient of .70 and above in scale development or adaptation studies indicates that the said assessment tool is reliable (Fraenkel & Wallend, 2012; Pallant, 2017; Robinson et al., 1999; Tezbaşaran, 1997). Therefore, it can be said that the internal consistency and composite reliability coefficients of the Turkish version of the scale are within acceptable limits. In this respect, it can be said that the Turkish-adapted Good Teaching Scale can be used to measure the perception levels of higher education students regarding the characteristics of good teaching on the strength of the evidence for its validity and reliability.

The search for good teaching and the determination of the good teaching concept in educational institutions is an important issue. The fact that the validity and reliability of the Good Teaching Scale were found to be sufficient in the findings of this study will enable investigation of perceptions regarding the characteristics of good teaching in various institutions in Turkey. There are serious gaps in the literature regarding assessment tools that can measure good teaching. For example, Alhija (2017) investigated university students' conceptions about good teaching and tried to determine whether there was a relationship between these concepts and students' background characteristics. The results indicated that in good teaching, the students perceived the assessment dimension as the most important component of good teaching, whereas they perceived the long-term student development as the least important. In addition, it was found that there were significant differences in students' perceptions of good teaching in terms of gender and the department where education was received.

There is a need for a valid and reliable assessment tool that can categorize and measure the perceptions of education stakeholders regarding the basic criteria that constitute the essence of good teaching. Due to the absence of a valid and reliable Good Teaching Scale developed or adapted to Turkish in the literature, it is expected that the Good Teaching Scale adapted to Turkish in this study will fill an important gap in the relevant literature. It is thought that the Good Teaching Scale will contribute to the relevant literature by serving as a source for future research on this subject. Since both the original form and the adaptation study of the scale were applied to higher education students, they will be able to present a perspective to the instructors about the quality, standard, or effectiveness of teaching practices in both undergraduate and graduate education. On the other hand, it is expected that the scale will provide a useful framework for what constitutes the essence of "good" teaching. The use of the scale in different studies and samples may contribute to the understanding of the psychometric properties of the scale. It is thought that this scale can be used to determine the perceptions of higher

education students, instructors, or teachers about good teaching.

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APPENDIX-1: İyi Öğretim Ölçeği Türkçe Versiyonu (Good Teaching Scale Turkish Version)

1 En düşük önemdedir	2 Düşük önemdedir	3 Orta önemdedir	4 Yüksek önemdedir	5 En yüksek önemdedir				
İYİ ÖĞRETİM MADDELERİ				**1**	**2**	**3**	**4**	**5**
1. Ders konularına yönelik motivasyon ve ilgiyi artırma				1	2	3	4	5
2. Ders konularını öğrenmeyi sağlayacak pratik bilgiler verme				1	2	3	4	5
3. Ders konularıyla ilgili temel bilgiler verme				1	2	3	4	5
4. Ders konularıyla ilgili bilgilerin genel bir çerçevesini tanıtma				1	2	3	4	5
5. Ders konularıyla ilgili bilgi ve araştırma yeteneği kazandırma				1	2	3	4	5
6. Yaratıcı ve yenilikçi düşünme becerileri kazandırma				1	2	3	4	5
7. Bağımsız ve nesnel düşünme yeteneği geliştirme				1	2	3	4	5
8. Bağımsız öğrenme becerisini geliştirme				1	2	3	4	5
9. Eğitimli kişinin sahip olması gereken bilgiyi kazandırma				1	2	3	4	5
10. Farklı fikir ve görüşlere açıklığı teşvik etme				1	2	3	4	5
11. Sözel becerileri geliştirme (örneğin, kanıtlar oluşturma ve sunma)				1	2	3	4	5
12. Yazma becerileri geliştirme				1	2	3	4	5
13. Topluluk karşısında sunum yapma becerilerini geliştirme				1	2	3	4	5
14. Açık ve anlaşılır bir şekilde öğretme				1	2	3	4	5
15. Öğrencileri verimli tartışmalara dâhil etme				1	2	3	4	5
16. Ders sırasında düzen ve disiplini sağlama				1	2	3	4	5
17. İlginç ve etkileyici bir ortamda öğretimi gerçekleştirme				1	2	3	4	5
18. Öğretme ve öğrenme için ders saatini verimli kullanma				1	2	3	4	5
19. Derste olumlu öğrenme ortamı oluşturma				1	2	3	4	5
20. Derse aktif katılımı sağlamak, farklı kaynakları okutmaktan daha değerlidir				1	2	3	4	5
21. Dersler ve uygulamaları (gezi, gözlem, laboratuvar, atölye vb.) arasındaki uyumu sağlama				1	2	3	4	5
22. Öğrencilerin ders sırasında soru sormalarına izin verme ve uygun dönütler verme				1	2	3	4	5
23. Ders sunumlarını ve diğer öğretim araçlarını etkili kullanma				1	2	3	4	5
24. Öğrencilerin derste daha fazla düşünmeleri için çaba sarf etme				1	2	3	4	5
25. Derste derinlemesine öğrenmenin gerçekleşebilmesi için zaman ayırma				1	2	3	4	5
26. Öğrencilerin çoğunluğuna göre seviyeyi ve öğretim yöntemlerini uyarlama				1	2	3	4	5
27. Dersi öğrenmeye katkı sağlayacak şekilde çevrimiçi web uygulamalarıyla entegre etme				1	2	3	4	5
28. Öğrenciler ile sürekli iletişim kurma (e-posta, ders dışı görüşme)				1	2	3	4	5
29. Öğrencilerin öğrenmelerini destekleme (teşvik etme, yardımcı olma ve rehberlik etme)				1	2	3	4	5
30. Öğrencilerin öğrenmesi ile ilgili empati kurma ve özen gösterme				1	2	3	4	5
31. Öğrencilerin ihtiyaçlarını dikkate alma (örneğin gereksinimler, testler)				1	2	3	4	5
32. Ödevleri, projeleri ve sınavları objektif ve adil bir şekilde değerlendirme				1	2	3	4	5
33. Öğrencilere sınavları ve projeleri hakkında faydalı geri bildirimler verme				1	2	3	4	5
34. Ders içeriği ile ilgili bilgileri ölçecek sınavlar uygulama				1	2	3	4	5
35. Sınavların bilginin ötesinde analitik düşünme, uygulama ve akıl yürütme gibi becerileri ölçmesini sağlama				1	2	3	4	5

Metaphors Developed by Teachers for the Gamification Approach in Education

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Article Info	ABSTRACT
Article History Received: 07/06/2022 Accepted: 12/11/2022 Published: 31/12/2022 **Keywords:** gamification, gamification in education, metaphor, teacher	The purpose of this study is to determine teachers' perceptions of gamification approach in education through metaphors. The study group of the research consists of 60 teachers who received "Gamification in Education" training under the Sakarya Provincial Directorate of National Education using the purposive sampling method. In order to collect data in the research, a "metaphor form" was prepared. In metaphor form, teachers said "It is like gamification; because…" were asked to complete the sentence. "Content analysis" method was used in the analysis of the data. The main problem of the research is, which metaphors do teachers use to describe the concept of gamification in education? According to the results of the research, 42 valid metaphors created by the teachers were grouped under 7 categories. Teachers' approach to gamification in education; It has been determined that they perceive it as an inclusive and entertaining approach that reflects real life, increases motivation, facilitates learning, increases imagination and creativity, reaches every child. The metaphors revealed as a result of the research can be used in terms of defining the gamification approach, facilitating its comprehensibility, and creating a rich content in revealing its difference from children's games.

INTRODUCTION

The 21st century is witnessing dizzying changes in information technologies (Özsoylu, 2017) with the Industry 4.0 revolution. These changes, which affect all areas of life, have brought the concept of Education 4.0 to the agenda of education as a result of the understanding of raising people suitable for the age (Puncreobutr, 2016). Existing educational understandings need new approaches in order to keep up with this transformation called Education 4.0 (Öztemel, 2018) In this context , many systemic change activities are carried out in the field of education in the world and in Turkey (Öncü, 2016).

Based on constructivism, which is one of the contemporary educational theories applied in many developed countries, the Ministry of National Education (Mine Çeliköz, 2017) updated its curricula in 2005, 2015 and 2018 in accordance with the requirements of the new era (MoNE, 2018). The aim of educating leader teachers who have acquired a culture of using and developing digital content effectively and ensuring that this culture becomes widespread in schools has been included in the 2023 Vision Document (2023 Education Vision, 2019) under the title of digital content and skill-supported transformation in learning processes. In this context, various trainings are organized for teachers in provinces. One of them is applied gamification training (NED, 2018).

In recent years, the increasing interest in digital games with the developments in the Internet and information technologies has revealed the concept of gamification in education (Özcan, 2019). It is thought that the attention and focus problems experienced by the children of the digital age, called digital natives, in the (Prensky, 2001) classical education processes can be solved through gamification, by increasing the motivation and dedication of the learners and making the education processes fun and interesting (Sezgin, Bozkurt, Yılmaz, & Linden, 2018). Gamification, with its general definition, is where reality is made playful and thus skills, motivation, participation and creativity are developed; It is an area affected by economic, cultural and social developments (Hamari, 2022).

Gamification is defined as the development of problem solving skills by using game structures in different areas outside the game (Zichermann & Cunningham, 2011). In a meta-analysis study conducted by Sailer & Homner (2022), it was stated that gamification is an effective method for teaching. Gamification of learning environments has been demonstrated that the gamification processes experienced by students support learning and increase the learning effect (Landers et al., 2018).

The gamification approach makes important contributions to our education system by attracting the attention of today's children to the lesson, due to its fun and motivation-enhancing features (Yıldırım & Demir, 2014) because one of the biggest problems faced by teachers is that students cannot attend classes due to low attention and motivation (Erümit, 2016). Effective instructional content is a prerequisite for successful gamification, as gamification is often used to enhance instruction, not replace it (Landers 2014).

In many content analysis studies conducted when the literature was scanned (Özcan, 2019), it (Kunduracıoğlu, 2018) was revealed that gamification positively affects motivation, academic achievement and student attitudes. In particular, providing formative feedback to students in the process is seen as a fundamental feature of gamification (Wouters et al., 2013; Prensky 2001, Werbach and Hunter 2012). In the research conducted by Aksoy and Usta (2020) on the use of badges in gamification, it is seen that teachers are warm to gamification. At the same time, it has been seen that the concept of gamification is confused with educational games in most of the studies (Karataş, 2014). While game-based learning is the teaching of lessons with games, gamification in education is the gamification of lessons with motivation-enhancing and interesting components such as points, badges, level and experience points (Yıldırım & Demir, 2014).

In the study conducted by Chin, Wang and Chen (2018), the effect of augmented reality-based mobile applications on student achievement and motivation was examined. Experimental results showed that students who had the opportunity to learn through the proposed system showed higher academic

achievement and higher motivation to learn.

In recent years, many studies have been conducted to examine the effects of gamified mobile applications on students' success and whether player types predict students' achievement scores. In a study conducted by Uğur-Erdoğmuş and Çakır (2022), it was revealed that gamified mobile applications have no effect on success, but player types are effective in predicting success.

Another study by Lopez and Tucker (2019) reveals that player types are a very important issue to be considered in gamification design.

Metaphors were used in this study in order to define the concept of gamification in education better and to reveal teachers' perceptions of gamification. Metaphor studies are used to structure the conceptual systems of the mind, simplify complex ideas and reveal mind maps (Arslan & Bayrakcı, 2006).

The relevant books and articles are examined, although there are metaphor studies about internet-based learning (Kaya, 2013), creative drama (Gündoğan & Ergenekon, 2019), the concept of toy (Giren & Durak, 2015), traditional game and digital game (Hazar, Demir, & Dalkıran, 2017), no previous metaphor analysis study about gamification in education and revealing teacher perceptions has been found. It is thought that the reason for this is that the gamification approach in education is new and therefore gamification training in education has not become widespread.

This study was conducted to determine teachers' perceptions of the concept of gamification in education through the use of metaphors. It is important in terms of filling this gap in the literature and creating a source for other researches.

Importance of Research

Metaphor is an important tool in revealing how the human mind perceives a concept. Based on the metaphors made for a concept, important predictions and retrospective evaluations can be made about those concepts (Coklar & Bağcı, 2009). With the metaphors put forward by teachers about the concept of gamification in education, it can be revealed what gamification is in education and what the meaning of in-service training given to teachers in this field is. The different metaphor definitions that are finally put forward in the research are also important in terms of being a source for new study areas or plans on gamification in education.

Purpose of the research

The aim of this study is to determine the perceptions of the teachers who participated in the gamification training in education within the scope of in-service training, about the concept of gamification in education through metaphors. For this purpose, answers to the following questions were sought in the study:

1. Using which metaphors did the teachers describe their perceptions of the concept of gamification in education?

2. Under which categories are the metaphors put forward by the teachers about the concept of gamification in education, in terms of their common features?

METHOD

In this part of the study, the research model, participants, data collection tool, data collection and data analysis are explained.

Model of the Research

In this study, in which the metaphorical perceptions of teachers about the concept of "gamification in education" are tried to be revealed, the phenomenology pattern, one of the qualitative research methods, was used. In phenomenological studies, data sources are individuals or groups that experience the

phenomenon that the research focuses on and can express or reflect this phenomenon (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2019).

Metaphors, a data collection technique from qualitative research methods, were used to determine teachers' perceptions and views on the concept of gamification in education.

The analysis of the data obtained within the scope of the study was made with the "content analysis" method.

Participants

This study, which aims to reveal the perceptions of teachers about the concept of gamification in education, includes teachers who worked in the province of Sakarya in the 2018-2019 academic year and received gamification training in education. Purposeful sampling method, one of the qualitative sampling methods, was used while choosing the study group in this study. Purposive sampling; Depending on the purpose of the study, it allows in-depth research by selecting information-rich situations (Büyüköztürk et al., 2019, p.92)

Table 1. *Numerical information of teachers*

		f	%
Gender	Male	15	25
	Female	45	75
Professional Seniority	1-5	2	3.3
	6-10	12	20
	11-15	27	45
	16-20	12	20
	21-25	6	10
	26 and above	1	1.7
	Total	**60**	**100**

When Table 1 is examined, it is seen that a total of 60 teachers, 45 female and 15 male, who received gamification training, participated in the research. When examined according to the years of professional seniority, it is seen that the teachers with 11-15 years of seniority have the highest share with 45%, 26 years and above show the lowest level of participation with 1.7%, and between 1-5 years show the lowest level of participation with 3.3%. It can be said that teachers between 6 -10 years and 16-20 years are evenly distributed with 20%.

Data Collection Tool and Data Collection

Within the scope of the study, 60 teachers who participated in the gamification training in education in Sakarya were reached by e-mail and telephone, and a form consisting of three parts, which was developed with the Google forms tool, was sent to the instruction, personal information and metaphor question. In the instruction part, teachers were informed about the concept of research and metaphor. In the personal information part, questions about the gender and professional seniority of the participants were included. In order to reveal the perceptions of the teachers participating in the research about the concept of gamification in education, in the last part of the participants, "Gamification. . . like, because…" were asked to complete the sentence. In addition, multiple entries were prevented by placing an e-mail restriction on the data collection tool. The data was collected through Google forms and no instructon was given. The forms were closed to the entrance at the end of the application and turned into documents and analyzed by the researcher.

Analysis of Data

The analysis of the metaphors obtained from the research was done with the "content analysis" method. In content analysis, researchers can make comparisons about the subject they are examining by developing appropriate categories, classifications or markings (Büyüköztürk et al., 2019, p. 259). It was carried out in the following five stages, which were revealed by the analysis of the metaphors put forward by the teachers (Saban, 2009).

Coding and Extraction Phase

The metaphors produced by the teachers were put in alphabetical order. The metaphors introduced were simply coded (eg "sun", rainbow", etc.). Responses that did not include a metaphor (n=4) were excluded. Some answers mentioned the benefits of gamification rather than metaphors (for example, it increases memorability, allows learning while having fun). Others made evaluations that could not be attributed to the metaphor (eg, enjoyable work and too serious.). For these reasons, 4 response forms were eliminated and excluded from the scope of this study.

Example Metaphor Image Compilation Phase

A total of 42 usable metaphors were obtained by eliminating those that did not contain metaphors from the answers given by the participants. For the categorization and evaluation stages, a sample metaphor list was created that can best represent each metaphor. In addition, the demographic information of the participant who created the metaphor was coded at the end of the metaphor. F and M letters were used for gender, and even numbers such as 10-15 as seniority years were used for professional experience. For example, the sun (M,10-15).

Category Development Phase

The metaphors created by the participating teachers were examined by taking into account the common qualities they have for the gamification approach in education, and 7 different conceptual categories were developed by using the sample metaphor list prepared during the compilation phase.

The Stage of Ensuring Validity and Reliability

Good definition of each of the stages in a qualitative research is one of the factors that increase the validity. (Buyukozturk et al., 2019, p. 265). In this study, data collection tools, how the data were collected, the selection of the participants, and the data analysis processes were explained in detail.

Another important issue in the analysis of qualitative data is the reliability, which reveals the coding accuracy of the data (Coklar & Bağcı, 2018).

For this purpose, two lists were given to the expert who worked on metaphor analysis: an ordered list of 42 sample metaphors and a list of 7 conceptual categories. The domain expert was asked to match all of the sample metaphors in the first list with the categories in the second list. Afterwards, the matches made were compared with the matches made by the researcher before, and consensus and disagreement were determined with the formula put forward by Miles and Huberman (1994: 64), and the matching agreement between the researcher and the field expert was calculated and found to be 96%.

Transferring Data to Statistics Program for Data Analysis

Within the scope of the research, 42 metaphors were identified and these metaphors were divided into 7 conceptual categories. Then, the number (f) and percentage (%) of participants showing 42 metaphors and 7 categories were calculated and the results were analyzed and interpreted.

FINDINGS

In this section, the metaphors that the participants produced for the gamification approach in education and the categories created by these metaphors are presented in the form of tables and the

findings for the purposes of the research are presented under subheadings.

Metaphors Produced About Gamification Approach In Education

The metaphors produced by the teachers participating in the research for the "Gamification in Education" approach are presented in Table 2 after the expressions that do not contain metaphors are removed.

Table 2. *Metaphors Produced by Teachers*

No	metaphor	f	%	No.	metaphor	f	%
1	Key	1	1.8	22	Do n't pretend	1	1.8
2	Memorialization	1	1.8	23	Humor	1	1.8
3	Making sense	1	1.8	24	The game	1	1.8
4	Mirror	3	5.3	25	Awarding	1	1.8
5	Glass full	1	1.8	26	Pizza	1	1.8
6	Chocolate	1	1.8	27	Advertisement	1	1.8
7	Child	2	3.6	28	Reading a novel	1	1.8
8	Experiment show	1	1.8	29	Mirage	1	1.8
9	Touch	1	1.8	30	Release of sparrow from cage	1	1.8
10	Ice cream	1	1.8	31	Table	1	1.8
11	Thinking	1	1.8	32	Concretization	1	1.8
12	a universal language	1	1.8	33	Candy	1	1.8
13	Rainbow	2	3.6	34	Syrup	1	1.8
14	Sun	2	3.6	35	Experience	1	1.8
15	Dreaming	2	3.6	36	Theatre	2	3.6
16	Life	7	12.5	37	Drinking the rain	1	1.8
17	To deceive	1	1.8	38	Learning by doing	1	1.8
18	Comedy show	1	1.8	39	a meal	1	1.8
19	Fun fair	1	1.8	40	Christmas tree	1	1.8
20	Tale	2	3.6	41	Star	1	1.8
21	Magnet	1	1.8	42	High jump	1	1.8
					TOTAL		42

The teachers participating in the research produced a total of 42 metaphors belonging to the "gamification in education" approach. According to the results of the research, the most used and repetitive metaphors among these metaphors were determined as "life" (7 times), "mirror" (3 times), and "theatre, fairy tale, dream, child, rainbow" (2 times). Accordingly, it is seen that the frequency of repetition of the metaphors used in the research is low.

Conceptual Categories Related To The Metaphors Produced About The Gamification Approach In Education

In the analysis and categorization of the metaphors produced by the participants, the content of the metaphors, their relationship with the image used, the reasons presented after "it is like..." and the common features were grouped. The metaphors produced by the teachers for the gamification approach in education are divided into categories under 7 headings. The numerical data of these categories are presented in Table 3.

Table 3. *Conceptual Categories of Gamification*

Categories	Metaphors	Metaphor frequency	Metaphor custom
Gamification as a source of motivation	Humor (1), magnet (1), chocolate (1), glass full (1), ice cream (1), candy (1), star (1), advertisement (1), awarding (1)	9	9
Gamification as a fun activity	Reading a novel (1), amusement park (1), comedy show (1), play (1), kid (2), jumping from height (1)	7	6
Gamification as a learning facilitator	Syrup (1), eating (1), touching (1), pretending (1), making sense (1), embodying (1), fooling (1), pizza (1)	8	8
Gamification as an inclusive approach that considers individual differences	Christmas tree (1), sun (2), rainbow (2), key (1), universal language (1)	7	5
Reflective gamification of real life	learning by doing (1), memorializing (1), table (1), theater (2), life (7), experience (1), mirror (3) sparrow from cage (1)	17	8
Gamification as an approach that develops imagination and creativity	Fairy tale (2), mirage (1), thinking (1), daydreaming (2)	6	4
Gamification as a waste of time	drinking the rain (1), experiment demonstration (1)	2	2
	TOTAL	56	42

Gamification as a source of motivation

It is seen that the common feature that becomes evident in the metaphors of this category is motivation. The metaphors (f=9) belonging to the category (9) were produced by the teacher. Gamification in education as a source of motivation "chocolate, ice cream, candy, etc." such as images that every child can love, interest, and desire to taste again, and "humor, magnet, rewarding, etc." Metaphors symbolizing motivation such as

The metaphor expressions representing the category of gamification as a source of motivation for the teachers participating in the research are as follows:

Gamification is like a magnet because it draws the child into that knowledge (M/20-25)

Gamification is similar to chocolate because chocolate attracts everyone. (F/11-15)

156

Gamification is like ice cream because the taste stays on your palate as you eat it. (F/20-25)

Gamification is like candy. Because as long as you taste it, there is no possibility that you will not like it. (F/11-15)

Gamification is like a star because it shows itself and always shines. (F/16-20)

Gamification is like a well-made advertisement. When the requirements to reach the product, that is, the result, are revealed by gamification, the individual does what is necessary to reach the result with his own will. The buyer is satisfied, the seller is satisfied. (F/6-10)

Gamification is like humor because motivation demands it. (F/11-15)

Gamification is similar to giving rewards because it motivates the child, attracts attention and prevents distraction (F/11-15)

If we compare life to a glass, gamification is like developing a perspective on the half-full glass. Because every gain that is gamified shows us a more positive and fun way to reach the goal. (F/11-15)

Gamification as a fun activity

It is seen that the common feature that becomes evident in the metaphors of this category is entertainment. The metaphors (f=7) belonging to the category (6) were produced by the teacher. Gamification in education as a fun activity can be defined as "amusement park, high jump, comedy program etc." used as metaphors consisting of fun images such as

The metaphor expressions of the teachers participating in the research that represent the category of gamification as a fun activity are as follows:

Gamification is like an amusement park because the child inside comes out. (F/6-10)

Gamification is like jumping from a height because it is exciting and fun for both the gamer and the player. (F/11-15)

Gamification is like a comedy program because you have fun, you laugh, but you can't explain why you laughed at the exit. (F/11-15)

Gamification is like reading a novel because you think you are just having fun while reading, but there has been a lot of things that it has taught you without realizing it. (F/11-15)

Gamification is similar to a game because both have rules and game elements, but there is no game mechanic in gamification. (F/11-15)

Gamification is like a child. Because it adds color to people's life. (F/20-25)

3.2.3. Gamification as a learning facilitator

It is seen that the common feature that becomes evident in the metaphors of this category is facilitating learning. The metaphor (f=8) belonging to the category (8) was produced by the teacher. Gamification as a facilitator of learning "pizza, syrup, eating, etc." used as metaphors consisting of images such

The metaphor expressions of the teachers participating in the research that represent the category of gamification as a facilitator of learning are as follows:

Gamification is like pizza, it both satisfies and makes you happy. (M/11-15)

Gamification is like syrup because syrups are sweet for kids to drink. But the goal is not taste, but utility. The purpose of gamification is not to play, but to reach the goal. (M/11-15)

Gamification is like eating, because in the end, we both satisfy our hunger for knowledge and experience and enjoy this work. (F/1-5)

157

Gamification is like touch because you descend into the student's life by gamifying the lessons. If we want to make the touch that he expects, it should be told with fun, and for this, I think it should be gamified. (M/6-10)

Pretending to gamify because what is actually done is not a game. (F/6-10)

Gamification is similar to making sense because it simplifies. (F/11-15)

Gamification is like concretization because the student shares the information with the group and reflects what is in his mind with action. (F/6-10)

Gamification is like cheating. Because he doesn't even realize he's learning when he thinks he's playing a game. (F/20-25)

3.2.4. Gamification as an inclusive approach that considers individual differences

It is seen that the common feature that becomes evident in the metaphors of this category is to observe individual differences and to reach every child. The metaphors (f=7) belonging to the category (5) were produced by the teacher. Gamification in education as an inclusive approach that considers individual differences "sun, rainbow, Christmas tree, etc." metaphorized using inclusive images such as

The metaphor expressions of the teachers participating in the research representing this category are as follows:

Gamification is like the sun. It warms and illuminates all children. (F/16-20)

Gamification is like a Christmas tree because there is a gift for everyone under it. (F/6-10)

Gamification is like a rainbow because it adds color to education, attracts the attention of every child and they are very happy when they see the game in education. (F/11-15)

Gamification is like a key that opens every door, because it can be used and improved in every field. (F/6-10)

Gamification is like a universal language. Because everyone can communicate with gamification (F/1-5)

3.2.5. Reflective gamification of real life

This category is the category in which the metaphors belonging to the highest number of teachers (f=17) and category (8) are produced, and the common feature that becomes evident in the metaphors is the reflection of real life. Here, "life (7), mirror (3), theater (2)" images come to the fore.

The metaphor expressions of the teachers participating in the research that represent the category of gamification reflecting real life are as follows:

Gamification is like life. Because every new situation or problem we encounter is like a new game with its own rules and fiction. (M/16-20)

Gamification is like a mirror because it reflects life. (M/11-15)

Gamification is like theatre, because life itself is a theater stage. (F/16-20)

Gamification is like a learning by doing gamification. Because it appeals to the child's five senses. (M/26+)

Gamification is like memoirization because what we learn becomes permanent because we employ more than one sense, entertainment, thus dopamine, socialization and communication. (F/16-20)

Gamification is like a table that brings students, parents and teachers together (F/11-15)

Gamification is similar to experience because it provides permanent learning. (F/11-15)

Gamification is like releasing a sparrow from the cage, because the children who are fixed on the benches are no different from the sparrows in the cage. (F/16-20)

3.2.6. Gamification as an approach that develops imagination and creativity

It is seen that the common feature that becomes evident in the metaphors of this category is the development of imagination and creativity. The (4) metaphors (f=6) belonging to the category were produced by the teacher. As an approach that develops imagination and creativity, gamification in education is "tale, dreaming, mirage, etc." expressed with metaphors consisting of images such as the metaphor expressions of the teachers participating in the research representing this category are as follows:

Gamification is like a fairy tale, because just as fairy tales develop our imagination, play also develops our creativity and imagination. (M/11-15)

Gamification is like daydreaming, because dreaming liberates and helps to reveal the potential within. (M/16-20)

Gamification is like a mirage. Because the child learns in a dream. (M/16-20)

Gamification is similar to thinking, because the child thinks and plays. (M/20-25)

3.2.7. Gamification as a waste of time

This category (2) consisted of (2) metaphor expressions put forward by the teacher. It draws attention to the limitations and usefulness of the gamification approach in education in the implementation and planning stages. In this category, it is seen that the features such as loss of time and inability to reach the goal become more pronounced. "Drinking the rain and experiment demonstration" images were used.

The metaphor expressions of the teachers participating in the research that represent the category of gamification as a waste of time are as follows:

Gamification is like trying to open your mouth and drink water while it's drizzling. In the time of drinking two or three sips of water, you will get drenched because the behavior, acquisition or information desired to be taught with the game may not reach the receiver or the receiver may make wrong inferences. In addition, the games take a lot of time and give little gain. (K/6-10)

Gamification is like an experiment show because if you put more or less material in the experiment, your students will be disappointed. They cannot reach the visual feast they expect. This does not make the subject memorable. (M/20-25)

DISCUSSION

In this study, in which teacher perceptions of the gamification approach in education were determined through metaphors, 42 metaphors were produced in 7 different categories. Teachers see the gamification approach in education as an inclusive and entertaining approach that reflects real life, increases motivation, facilitates learning, increases imagination and creativity, and reaches every child. Deterding, Dixon, Khaled, and Nacke (2011) consider gamification "the use of game designs in in-game contexts to add play, passion, and fun to activities and completion. On the other hand the findings of this study (Bolat, Şimşek, & Ülker, 2017) coincide with the research findings, which were determined by the gamified learning environment to have benefits such as easy learning, increasing permanence, fun learning, increasing the learning speed, coming to the lesson prepared, focusing on the lesson and being motivated to the lesson. Among the metaphors created, magnet, ice cream, candy and chocolate metaphors are some of the metaphors that represent this.

Perceiving gamification as a source of motivation in the study; the findings in the literature that gamification increases motivation. (Hamari, Kouvisto, & Sarsa, 2014; Buckley & Doyle, 2016; Sezgin, Bozkurt, Yılmaz, & Linden, 2018; Wichadee & Pattanapichet, 2018). The increase in the motivation of

the participants is achieved by carefully integrating a number of components into the gamification design for a specific purpose. The concepts of game and gamification diverge at this point. For example, for those working on a gamified activity, solving the puzzle with components such as difficulties and limitations is a real goal (Liu, Alexandrova, Nakajima, & Lehdonvirta, 2011).

Metaphors that describe gamification as an inclusive approach that considers individual differences reveal the perception that students with different learning styles find something from themselves and are involved in the learning process. Gülbahar (2005) states that learning styles and individual differences have a positive effect on success when they come together with technology-enriched and well-designed learning environments. The sun, rainbow and Christmas tree metaphors are some of the metaphors that represent this.

Metaphors produced for the gamification approach as a facilitator of learning support the finding by Kalkan (2016) that gamification plays an important role in increasing the level of success and flow. On the other hand, gamification, which is perceived as reflective of real life, contradicts the view that the play (Huizinga, 2017) in Homo Ludens is a world beyond the human's living space, outside of his reality. Whereas Kapp (2012) used gamification, transforming life experiences into playful actions, and McGonigal (2011) expresses it as a new approach that can be used to solve real-life problems. At this point, it can be said that the concepts of game and gamification diverge.

Metaphors that see gamification as a disappointment and a waste of time when it is not well designed also supports Avşar and Isabetli's (2017) view that gamification design should be done well in order to make the learning process more efficient and effective in gamification applications. The metaphors of drinking the rain and demonstration of experiment are some of the metaphors that represent this.

The perceptions of the teachers participating in the research are that the features such as motivation, attention, entertainment, individual differences, imagination and creativity required by the 21st century education understanding can be gained by the gamification approach.

SUGGESTİONS

The metaphors revealed as a result of the research can be used in terms of defining the gamification approach, facilitating its comprehensibility, and creating a rich content in revealing its difference from children's games. In this study, teachers' perceptions of the gamification approach in education were revealed, and the school type, school level and branch of the participants were not considered. Considering these variables, studies can be done on this. In order to bring a holistic perspective to the gamification approach in education, research on student perceptions at different levels can also be conducted.

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Exploring pre-service pre-school teachers' perceptions of the nature of science: A qualitative study

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Article Info	ABSTRACT
	The purpose of this study is to examine pre-service pre-school teachers' understanding of the nature of science. In this study, phenomenology design, one of the qualitative research methods, was used. A total of 36 pre-service pre-school teachers who were studying in the fourth grade of a university in Turkey in the Preschool Teaching Department of the Faculty of Education in the 2020-2021 spring semester participated in the research. A questionnaire consisting of ten open-ended questions was used in the study. The data were analyzed by content analysis. As a result of this research, it was observed that pre-service pre-school teachers mostly did not have sufficient views on the examined dimensions of the nature of science and they had misconceptions. Based on the results of the research, it can be suggested that postgraduate education, in-service training and workshops focused on the nature of science will be beneficial for teachers and pre-service teachers. In addition, it may be suggested to improve the courses on the nature of science and scientific inquiry and/or add such courses to the undergraduate program. It can be suggested that the courses on the nature of science should be given not only at the undergraduate level, but also in other teaching levels in accordance with the grade level.

INTRODUCTION

Training individuals with the mastery of 21st century skills who do not accept information as it is, rather evaluate it critically, question, research, solve problems and make evidence-based decisions has become a necessity of our age. In support of this, the 10 important skills in the World Economic Forum's "The Future of Jobs" report are listed as follows: 1-Analytical thinking and innovation, 2-Active learning and learning strategies, 3-Problem solving, 4-Critical thinking and analysis, 5-Creativity, originality, pioneering, 6-Leadership, 7-Technology use and control, 8-Programming, 9-Flexibility, stress tolerance, 10-Reasoning, problem solving (WEF, 2020). Science education plays an important role in education in order to train qualified individuals having these skills. Individuals having these skills are also science literate individuals. An individual who is trained to be science literate is sensitive to social problems, engages in reasoning to solve these problems and has creativity and analytical thinking skills. These people are individuals who can understand science and its nature, and besides all these, who can use science and the nature of science in their lives at the appropriate time (Milli Eğitim Bakanlığı [MEB], 2013). The two fundamental components of science literacy are the nature of science and the nature of scientific inquiry (Schwartz, Lederman and Crawford, 2004; Lederman, 2009; Lederman and Lederman, 2012; Lederman, Lederman and Antink, 2013). As can be understood from here, the nature of science is an important part of science literacy (Akerson, Avsar Erumit & Kaynak, 2019; Lederman, 2007). When the relevant literature is reviewed, it is seen that the necessity of students to have sufficient understanding about the nature of science is mentioned with a similar perspective (AAAS, 1990; NRC, 1996; Akerson, Abd-El-Khalick and Lederman, 2000; Lederman and Lederman, 2012). On the other hand, in many studies, it is stated that students mostly have insufficient beliefs about the nature of science (Schwartz et al., 2004; Lederman, 2007; Lederman and Lederman., 2014; Leblebicioğlu et al., 2017). In this context, training science literate (understanding the nature of science) individuals is among the main objectives of all education programs, starting from pre-school education to higher education (NRC, 1996).

In particular, education in the pre-school period, where development and learning are very rapid and the brain architecture of individuals develops, can have significant effects on the future lives of individuals. The education given in this process is important in the cognitive, emotional and social development of individuals and the knowledge and skills gained in this period form the basis of individuals' lives (Altay, 2011; MEB, 2006; Sezer, 2019). For this reason, a qualified science education that includes science and the nature of science should be offered starting from the pre-school period because such a science education given to preschool children improves their scientific thinking skills and enables them to learn science concepts (Akerson et al., 2011; Eshach and Fried, 2005; Olgan, Alpaslan and Öztekin, 2014). In the preschool period, children feel the need to satisfy their curiosity about the events happening around them. For this reason, it is seen as one of the objectives of science education that children become aware of their environment and understand their environment (French, 2004). Thus, it is seen that the basic concepts of science are acquired in the pre-school period and forming the basis of science literacy is also included among the objectives of pre-school education (Lind, 2005). For the accomplishment of this objective, pre-school teachers and pre-service teachers need to have knowledge about science and the nature of science. When they have knowledge on this subject, they can accurately reflect science and the nature of science to children. Indeed, research shows that in order for students to learn about the nature of science, teachers must understand it and how to teach it (Akerson, Cullen and Hanson, 2009; Sorensen, Newton and Mccarthy, 2012). Touching upon this point, Toyoma (2016) emphasizes that teachers have tasks such as motivating students to learn science, arousing students' curiosity about science and encouraging students to research and discover. Facilitated by educators, students' natural curiosity drives learning processes and comprehensive subjects are integrated into various subject areas (NAAEE, 2019). For such reasons, it is expected that teachers should have sufficient knowledge and experience about the nature of science and have a

positive (advanced) perspective on the nature of science (Akerson, Cullen and Hanson, 2009; Baykara and Yakar, 2020; Lederman, Bartos and Lederman, 2014; Mesci, Çavuş Güngören and Yeşildağ Hasançelebi, 2020; NRC, 1996). When the literature is examined, it is seen that both pre-service teachers (Abd-El Khalick and Boujaude, 1997; Doğan Bora, 2005) and teachers' thoughts on the nature of science are insufficient (Dorji, Jatsho, Choden and Tshering, 2022; Lederman, 1992; Schwartz et al., 2004; Lederman and Lederman, 2004; Lederman, 2007; Lederman et al., 2014).

Moreover, although much emphasis has been placed on the importance of giving education on the nature of science starting from the pre-school period in the literature (AAAS, 1990; Abd-El-Khalick, Bell and Lederman, 1998; Akerson et al., 2011; NRC, 1996), there is not enough research in this area. In other words, in the literature, there are many studies on the nature of science conducted at elementary, secondary and tertiary levels of education (Çakıcı and Bayır, 2012; Doğan and Abd-El-Khalick, 2008; Doğan and Özcan, 2010; Erdoğan, Çakıroglu and Tekkaya, 2006; Kaya, 2012; Korkmaz, Altun, Üstkaya and Usta, 2014; Küçük, 2006). In addition, it is seen that studies on the nature of science have generally been carried out on science, physics, chemistry, biology, mathematics teachers and pre-service teachers (Abd-El-Khalick and Akerson, 2004; Doğan-Bora and Abd-El-Khalick, 2008; Gürses, Doğar and Yalçın, 2005). On the other hand, it is seen that there are few studies that examine the perceptions of pre-service pre-school teachers about the nature of science in detail (Cumhur, Yıldırım, Bolat and İskeleli, 2018; Erdaş-Kartal and Ada, 2018; Mıcık, 2021). Thus, conducting further studies with the participation of pre-service pre-school teachers seems to be of great importance because they will be the teachers of future who will introduce children to the nature of science and help them understand it. For this reason, it is thought that the current study will help fill the gap in the literature and provide guidance to similar studies. In addition, the current study employed the phenomenological design in order to make detailed analyses, unlike the quantitative studies in the literature. In the current study, which was carried out considering all these issues, it was aimed to examine the views of pre-service pre-school teachers on the nature of science. In this connection, the questions that guide the study are as follows

• What are the opinions of pre-service pre-school teachers about what science is?

• What are the opinions of pre-service pre-school teachers about scientific knowledge being open to change?

• What are the opinions of pre-service pre-school teachers about the subjectivity of scientific knowledge?

• What are the opinions of pre-service pre-school teachers about the effect of imagination and creativity on scientific knowledge?

• What are the opinions of pre-service pre-school teachers about the effect of social and cultural life on science?

• What are the opinions of pre-service pre-school teachers about the existence of a universal scientific method used in scientific studies?

• What are the opinions of pre-service pre-school teachers about the concepts of theory and law?

METHOD

Research Design

The current study employed the phenomenological design, one of the qualitative research methods. The main goal in the phenomenological design is to reveal how the participants make sense of a situation (Johnson and Christensen, 2014). As it was aimed to examine pre-service pre-school teachers' perceptions of the nature of science in depth in the current study, the phenomenological design was preferred.

165

Research Study Group

The study group of the current research is comprised of fourth-year students attending the Department of Preschool Teaching in the Education Faculty of a university in Turkey in the spring term of the 2020-2021 academic year. The participants of the study were determined by using the criterion sampling method, one of the purposive sampling methods. The criteria used in the selection of the participants are their having already taken the course of Science Education, having the experience of teaching practice at least for one term and being volunteer to participate in the study. As a result, a total of 36 pre-service pre-school teachers, 31 females and 5 males, participated in the study.

Research Instruments and Processes

A questionnaire consisting of 10 open-ended questions developed and prepared by the researchers was used as a data collection tool in the study. The reason for choosing this data collection tool is to understand more deeply the reasons underlying the answers compared to the scale consisting of closed-ended questions and to reach relatively more generalizable results compared to semi-structured interviews (Creswell, 2008). In order to establish the content validity of the questions in the questionnaire, the opinions of two field experts, one with a doctorate in science education and one with a doctorate in pre-school education, were sought. The online version of the questionnaire was prepared and sent to the participants to be completed. Before the application, the teachers were informed that their personal information would be kept confidential and that the data would only be used for scientific purposes. In addition, collecting data online brought advantages such as participating in the process at any place and time, and feeling comfortable. Some sample items in the questionnaire are as follows:

1. What do you think is science?

2. What comes to your mind when you think of the nature of science?

3. Do you think that the thoughts of the person revealing the information and the way of his/her interpreting the information affect scientific knowledge? Why?

4. Do you think imagination and creativity have an effect on the production of scientific knowledge?

5. Can theories turn into laws over time? Why?

Data Analysis

After the data collection stage was completed, all the data were transferred to MS Excel and printed out. Then, starting from PT1, each document belonging to the controlled data was given a code as PT1, PT2, ….PT36. The data were analyzed by using content analysis. Two field experts, one working in the field of science education and the other in the field of preschool education independently analyzed the data. Data analysis was carried out on the basis of the content analysis approach proposed by Creswell (2008). Creswell states that content analysis has three main stages: the preliminary exploratory analysis, coding process and thematic analysis. In the preliminary exploratory analysis stage of the current study, the data were read twice to get an overview of the data. During the readings, some notes about concepts and ideas were taken and how the data could be organized within the framework of these notes was considered. In the coding process stage, the data were coded. After the completion of the coding performed one by one, similar codes were grouped and unnecessary codes were discarded. Afterwards, it was checked whether new codes would emerge and re-coding was performed to prevent any possible mistake. After the final coding, it was decided to exclude the codes represented by below 3% from the study. Finally, in the thematic analysis stage, it was tried to create related themes. Reliability coefficients were calculated between the coders to give the final form of the themes. While doing this, first, consistency was established between the main themes. Afterwards, the number of

participants thought to be under each theme was examined. Discussion continued until 100% consensus was reached in these reviews.

FINDINGS

Pre-Service Pre-School Teachers' Opinions about What Science Is

In the study, firstly, the pre-service pre-school teachers' understanding of science was questioned. As a result, it was seen that the opinions of the pre-service pre-school teachers about what science is gathered around the themes of the field of study of science, the purpose of science, the qualities of science, methodology, content of science, what science provides and what science resembles. The codes of the universe and the world in the theme of the study area of science, the codes of provable and reality in the theme of the qualities of science, the codes of experiment, observation, different techniques and methods in the theme of methodology and the code of information in the theme of what is in the content of science were expressed as opinions by more pre-service teachers. PT9 and PT30's opinions on what science is, respectively, are as follows:

"In my opinion, science is an effort to make sense of the universe and nature and consists of proven facts that always give the same result everywhere."

"The way of knowledge, consistent information, which reaches certain laws based on reality, by dealing with a part of the universe, phenomena and events in the universe, using some methods and experimental ways."

It is also seen that PT3 likens science to a light. PT3's opinion is as follows:

"Science is a light that illuminates the darkness of the unknown. It makes our lives easier in many areas by developing and renewing over time."

Pre-Service Pre-School Teachers' Opinions about What the Nature of Science is

It was examined what the participants understood from the expression "nature of science". In this connection, it was seen that the opinions of the participants about the nature of science are gathered around the themes of knowledge, scientific knowledge, science, research-study-inquiry, scientific processes, fields of study, method, what the nature of science provides, the characteristics of the nature of science, and people who are related to the nature of science. The code of the development of scientific knowledge within the theme of scientific knowledge, the codes of the functioning of science and what science is within the theme of science were reported as opinions by relatively more pre-service teachers. When the themes in this category are examined, it is seen that the participants produced too many codes. In other words, each participant made very different statements from each other. Opinions of participants PT26, PT30 and PT33 on what science is, respectively, are as follows:

"In relation to the nature of science, the first thing that comes to my mind is the structure that brought science into existence, the factors that were involved in the formation of science and that are constantly there. For example, man."

"What is meant by the nature of science is the sum of answers to questions such as what science is, how it works, how scientists organize their scientific research, how scientific knowledge emerges and how it develops, and what factors it is affected by."

"It is the answers to the questions such as what science is, how it works, how it came into existence and these answers have their own characteristics and these characteristics should be investigated to reach these answers."

In addition, the answer of PT8, who stated that the nature of science covers the time from past to present, is also interesting:

"The functioning of science from past to present within its own system."

Opinions of the Pre-Service Pre-School Teachers about How to Distinguish What is Scientific and Non-Scientific Knowledge

How the pre-service pre-school teachers distinguish between scientific and non-scientific knowledge; that is, their understanding of scientific knowledge, was examined. In this context, it is seen that the opinions are gathered around the themes of features of scientific knowledge, features of non-scientific knowledge, what is done to distinguish and what is used to distinguish. More opinions were expressed by the pre-service teachers on the codes of the provable and objective in the theme of the features of scientific knowledge, the code of the subjective in the theme of the features of non-scientific knowledge, the code of the experimental in the theme of those used to distinguish. The opinions of PT11, PT34 and PT35 about what science is are as follows:

"Its having been proven and reached through experimentation and observation."

"In my opinion, the way to distinguish scientific knowledge from non-scientific knowledge is its being reasonable and logical in the first place. In my opinion, any knowledge and fact that reason and logic do not accept is not scientific. And this is followed by testability, provability."

"Scientific knowledge is objective and provides evidence based on experiments and is universal. Non-scientific knowledge is not based on evidence."

The answers given by PT5 and PT23 are similar. The opinions of PT5 and PT23 are as follows, respectively:

"Scientific knowledge has been proven to be correct and is observable, measurable, and the fact that it gives the same result every time shows that it is scientific knowledge; otherwise, it is not scientific."

"In order for a piece of information to be scientific, it must be observable, measurable and give the same results in every measurement."

Opinions of the Pre-Service Pre-School Teachers about Scientific Knowledge being Open to Change

The pre-service re-school teachers were asked questions about whether scientific knowledge is open to change and why. While 31 of the pre-service teachers stated that science is open to change, 4 of them said that it is not open to change and one pre-service teacher stated that it is sometimes open to change. PT13, on the other hand, did not express his/her opinion on the reason for the change. It is seen that the opinions of the pre-service teachers who stated that science is not open to change are gathered around the theme of objectivity. Codes such as knowledge's being proven, unchangeable and certain, and certainty of its accuracy were expressed as opinions within the theme of objectivity by the pre-service teachers. The opinion expressed by PT30 in this regard is as follows:

"Science does not change. Scientific knowledge is proven knowledge. It does not change; it is certain."

There is only one pre-service teacher who said that some of the scientific knowledge is open to change. The opinion of this participant is as follows:

PT21: "I think some of it is open to change while some is not. For example, the fact that water boils at 100 degrees does not change, but when Pluto was once a planet, then new sources revealed that it was not a planet."

The opinions of the pre-service teachers who stated that scientific knowledge is open to change are gathered around the themes of innovations and changes in old ones, development, study and

168

research, time of change, differences, characteristics of change, progress, field of change, characteristics of science and knowledge. More opinions were expressed by the pre-service teachers on the codes of obtaining new information and changing old information within the themes of innovations and change of old ones. PT15 and PT34's opinions on this subject are as follows:

"Of course, it is open to change, in the developing and changing world, everything is changing rapidly at any moment. In this change, scientific knowledge cannot remain constant, there may be some that do not change, but all of them cannot remain constant."

"Yes, scientific knowledge should be open to change because, besides being objective, scientific knowledge should be provable with a number of methods. For example, while a scientist evaluates a phenomenon or a concept in his/her own mental perspective and presents a proof, another scientist can handle the same phenomenon and concept in very different ways."

Opinions of the Pre-Service Pre-School Teachers on the Subjectivity of Scientific Knowledge

The pre-service pre-school teachers were asked a question about whether the thoughts of the person revealing the knowledge and the way of his/her interpreting the knowledge affect scientific knowledge and why. While 28 of the pre-service teachers stated they would affect it, 7 of them stated that they would not and one pre-service teacher did not express any opinion. PT2, PT10 and PT20 did not state the reason for their opinions. The answers given by the pre-service teachers about the reasons for the subjectivity of scientific knowledge were examined in detail. In this context, it is seen that the opinions of the pre-service teachers who stated that they do not affect are gathered around the theme of objectivity. The opinions of PT7 and PT27 who think in this way are as follows:

"They should not affect. If they affect, it is problematic. Because there must be proven information. There should be no subjective opinion."

"The person presents his/her thoughts together with evidence. In my opinion, they do not affect. He/she presents objective information."

The opinions of the pre-service teachers who stated that they affect are gathered around the themes of subjectivity, characteristics of knowledge, type and direction of effect. More opinions were expressed by the pre-service teachers on the codes of personal opinions, different perspectives and the fact that the information is not independent from interpretations within the theme of subjectivity. Opinions of PT3, PT8, PT33 and PT34, who think in this way, are as follows, respectively:

"Of course, the information is affected by the thoughts of the person who reveals the information. A person expresses his/her knowledge together with his/her feelings and thoughts. Thus, it is somehow affected anyway."

"They affect because everyone's perspective is different. While perspectives present a wide range of perspectives, they can also lead to narrow thinking. Depending on the point of view, the resulting product can be affected positively or negatively. At the same time, scientific knowledge is not objective because knowledge is changeable."

"They affect because people may think differently on the different aspects of knowledge."

"Yes, they affect. Scientific knowledge is objective in terms of demonstrability and provability; however, how the people who reveal this evidence form the evidence, that is, the way they interpret it, also affect scientific knowledge. Some differences may emerge in the interpretations of different people with the effect of the characteristics of the society or culture they live in."

Opinions of the Pre-Service Pre-School Teachers about the Effect of Imagination and Creativity on Scientific Knowledge

The pre-service pre-school teachers were asked a question about whether imagination and creativity have an effect on the production of scientific knowledge, if so, how imagination and creativity affect scientific knowledge, or if not, what the reason for this is. While 33 of the pre-service teachers said it would affect, 1 said it would not and 2 pre-service teachers stated that it should not affect much. PT22 did not state the reason for his/her opinion. When the answers given by the pre-service teachers about the effect of imagination and creativity on scientific knowledge were examined, the opinion of the pre-service teacher who said that it would not affect was represented by the code of the existence of mathematical calculation. The opinion of PT1 who thinks in this way is as follows:

"No. Because everything has a mathematical calculation."

The opinions of the pre-service teachers who stated that it should not affect too much are based on the views that scientific knowledge is based on reality. Opinions of T20 and PT36 who think in this way are as follows:

"No, there is no effect. Imagination may be involved in the stage of emergence of scientific knowledge, otherwise it should not be involved."

"In my opinion, imagination and creativity do not have much effect on the production of scientific knowledge because scientific knowledge is mostly based on reality."

The opinions of pre-service teachers who stated that it affects are gathered around the themes of contributions of imagination and creativity, the stages where imagination and creativity are effective, the reasons for the necessity of imagination and creativity, the characteristics of imagination and creativity, the people who should have imagination and creativity, if there was no imagination and creativity, and the type of effect. More opinions were expressed by the pre-service teachers on the code of being able to look from different perspectives within the theme of the contributions of imagination and creativity and the code of scientists under the theme of people who should have imagination and creativity. The opinions of PT9 and PT15 are as follows:

"Yes, there is. Imagination and creativity will contribute positively to the process. Let me give an example of the invention of something new; if Edison had not tried different methods while trying to find the light bulb, or if he had not been able to use his creativity and rather used the existing knowledge like other people, he would not have come up with the invention."

"Yes, there is. People with developed imagination and creativity cannot remain where they are, they constantly want new things, and their sense of curiosity is at the forefront. This creativity and imagination is very important in the production of knowledge."

Opinions of the Pre-Service Pre-School Teachers on the Effect of Social and Cultural Lives on Science

The pre-service pre-school teachers were asked a question about whether science is affected by the social and cultural life of the scientist and why. Thirty-five of the pre-service teachers stated that it is affected while one of them stated that it is sometimes affected. PT12, PT13 and PT28 did not state the reason for their opinions. When the findings obtained from the answers given by the pre-service teachers about the effect of social and cultural life on science are examined, the opinion of PT7, who stated that social and cultural life sometimes affects science, is as follows:

"Which branch of science people will be directed to can be affected, but I don't think the content of science will change much."

It is seen that the opinions of the pre-service teachers who stated that they would affect are gathered around the themes of factors affecting, factors arising from the environment in which one lives, the things affected or not affected by social and cultural life, type and direction of effect, human characteristics, reasons arising from science and scientific knowledge, social reasons, reasons arising from needs. More opinions were expressed by the pre-service teachers on the code of environment in the theme of reasons arising from the environment in which one lives and the code of being a social being in the theme of human characteristics. The opinions of PT5, PT9, PT23 and PT34 are as follows:

"It is affected. Man is a social being, he/she is affected by society and naturally his/her work is also affected by this."

"It is affected. Living standards, certain taboos of society can affect positively or negatively. For example, due to a certain sexist perception attributed to women in the world, their professions are standardized. The number of male scientists is higher than that of female scientist (women's household responsibilities and maternity status, etc.)"

"All factors such as social structure, power centres, politics, socioeconomic level, philosophy, religion, etc., in the environment of the scientist affect science because science cannot be thought in isolation from society."

"Yes, it is affected. In which culture and social environment the person is brought up or which characteristics of the environment he/she is exposed to will have some reflections to a certain extent on the scientific information he/she is working on. This is inevitable."

Opinions of the Pre-Service Pre-School Teachers on the Existence of a Universal Scientific Method Used in Scientific Studies

The pre-service pre-school teachers were asked whether there is a scientific method that scientists use in scientific studies and that is accepted by everyone, and if there is, the reason for using this method. While 25 of the pre-service teachers stated that there is such a method, 4 of them stated that there is not and 7 pre-service teachers stated that they do not know. PT24, PT29, PT34 and PT36 stated that there is a scientific method, but they do not have adequate knowledge about it. PT2, PT20, PT22 and PT27 did not state the reason for their opinion. When the findings obtained from the answers given by the pre-service teachers about the existence of a universal scientific method are examined, the opinion of the pre-service teacher who said that there is no universally accepted method was coded as the studies containing a scientific method unique to them. The opinion of PT19 is as follows:

"I think everyone's work has its own scientificity, their common point is reaching valid results."

It is seen that the opinions of the pre-service teachers who stated that there is a universally accepted scientific method are gathered around the themes of the methods, tools and resources used, the characteristics of the methods, the usefulness of the study, acceptability by everyone, knowledge, and scientificity. More opinions were expressed by the pre-service teachers on the code of experiment and observation in the theme of methods, tools and resources used. The opinions of PT9, PT23 and PT32 are as follows, respectively:

"There is. Questionnaire and interview methods are largely preferred. I think the accuracy of scientific work is important in terms of improving the reality (The methods I have mentioned provide first hand data)"

"Scientists use generally accepted scientific methods in their studies because the studies carried out to prove the accuracy of scientific knowledge must be accepted by everyone."

"There is, there are measurement tools that are accepted by everyone or they can convince everyone with more concrete data."

The opinion of PT15, who stated that we cannot use the same method in every study even if there is a universal scientific method, is as follows:

"There might be. But I think that the same method cannot be applied to every piece of scientific knowledge all the time. There is a certain order, but we cannot try everything the same way."

Opinions of the Pre-Service Pre-School Teachers about the Concepts of Theory and Law

The pre-service pre-school teachers were asked a question about what the concepts of theory and law mean to them. When the answers given by the pre-service teachers are examined, it is seen that their opinions about the concept of theory are gathered around the themes of definition of theory, characteristics of theory, provability, certainty, explanation, methods of obtaining and testing. More opinions were expressed by the pre-service teachers on the codes of knowledge and opinion in the theme of definition of theory and the codes of the proven and unproven in the theme of provability. It is seen that the opinions of the pre-service teachers about the concept of law are gathered around the themes of definition of law, characteristics of law, provability, certainty and the methods used. The opinions of PT8 and PT9 are as follows:

"Theories are explanations obtained by the scientific method and repeatedly tested and confirmed through observations and experiments. Laws are statements based on repeated empirical observations that describe a particular phenomenon of nature."

"Theory: general scientific statements that have been proven to be true. Law: explains a single, narrower, more specific situation than theory."

The opinions of PT23 and PT30 on the concepts of theory and law are similar. The opinions of PT23 and PT30 are as follows:

"That is, a scientific law gives a very clear but narrow definition of a phenomenon or set of facts. The theory gives a holistic explanation of as many phenomena as possible."

"That is, while a scientific law gives a very clear but narrow definition of a phenomenon (or set of facts), a theory gives a holistic explanation of as many facts as possible. In short, law describes a phenomenon, theory explains many phenomena. The relationship between law and theory is as follows: A theory must obey existing scientific laws."

Opinions of the Pre-Service Pre-School Teachers about the Transformation of Theories into Laws

The pre-service pre-school teachers were asked a question about whether the theories would turn into laws over time and why. Twenty-eight of the pre-service teachers expressed their opinions as yes and 7 of them as no. PT34, on the other hand, stated that he/she did not have any knowledge on this subject. PT11, PT20, PT22 and PT30 did not state the reason for their opinion. When the findings obtained from the answers given by the pre-service teachers about the transformation of theories into laws are examined, it is seen that the opinions of the pre-service teachers who said that theories do not turn into laws are gathered around the themes of theory and laws being different, innovations and change and characteristics of theories and laws. The opinions of PT9, PT21 and PT35 on the subject are as follows:

"In our former education, we learned that it can transform, but I do not think that this is the case in undergraduate education. I don't think there is a hierarchical relationship between them. Because the law is a more specific situation, the situation will change with each experiment."

"It does not transform because the law maintains its reality independently of people. However, theories are a human product and are always bound to change with new information."

"No it does not transform because over time, a theory can lose its effect when new information is added."

It is seen that the opinions of the pre-service teachers who stated that theories turn into laws are gathered around the themes of the prerequisite for theories to turn into laws and the consequences of theories becoming laws. More opinions were expressed by the pre-service teachers on the code of if proven in the theme of prerequisite for theories to turn into laws. The opinions of PT4 and PT5 are as follows, respectively:

"After the theories are put forward by people, they can become laws by being proven over and over again. "

"Theories become laws after they are applied over time and their general validity is accepted."

DISCUSSION, CONCLUSION, RECOMMENDATIONS

Striking results were obtained in this qualitative study, which was conducted to examine pre-service pre-school teachers' understanding of the nature of science. It was concluded that the pre-service teachers limit science to the fields of study such as the universe, the world and nature, and that they see it as a tool that has methodologies such as experiment and observation, that facilitates and gives meaning to human life, and enables the unknown to be found. In addition, it was observed that science was defined in different ways such as including certainty, being independent of time and space, real and objective. When the answers given are examined, it can be said that the pre-service teachers have partially limited opinions on what science is and its definition and that they gave partially acceptable answers. Opinions on how science is defined and what science is are very important because these opinions reveal the opinions on the epistemology of science (Ryan and Aikenhead, 1992). In light of the results obtained in the current study, it can be said that the pre-service teachers' opinions and point of views on science should be developed. When the different answers given are examined in the current study, it is seen that there is no consensus, similar to many other studies in the literature (Arı, 2010; Aslan, 2009; Beşli, 2008; Kenar, 2008; Saraç, 2012). Yenice, Özden ve Balcı (2015), on the other hand, compared the views of pre-service science and primary teachers. As a result of the study, it was observed that a common decision could not be reached on the definition of science, but the pre-service teachers had an acceptable point of view to a large extent. Doğan-Bora (2005), on the other hand, found that the pre-service teachers who participated in the study did not have valid views on the definition of science and the epistemology of scientific knowledge.

Secondly, the pre-service teachers' understanding of the nature of science was examined. It was observed that the participants saw the nature of science as knowledge, science and scientific knowledge, and thought of it as an answer, field or structure that enables research, discovery and examination with its own characteristics. Although partially valid answers were given, it was observed that the views of the pre-service teachers were not sufficient in general and they had misconceptions. When the literature was examined, similar results were found in studies conducted on pre-service pre-school teachers (Abd-El-Khalick and Akerson, 2004; Öztaş, 2019; Türk, Yıldırım, Bolat and İskeleli, 2018). In addition, it is striking that similar results were obtained in studies conducted with the participation of pre-service teachers from different branches (Abd-El-Khalick and BouJaoude, 1997; Akerson, Morrison and McDuffie, 2006; Aslan, 2009; Aslan, Yalçın and Taşar, 2010; Cofre et al., 2014; Doğan and Abd-El-Khalick, 2008; Dorsah, 2020; Erdaş-Kartal and Ada, 2018; Mesci, 2016; Yenice and Ceren-Atmaca, 2017). The fact that generally similar results have emerged from the studies carried out with pre-service teachers and that this has continued from the old studies to the current studies show that there are deficiencies in the understanding of the nature of science and a problem is experienced in this regard. Abd-El-Khalick, Bell and Lederman (1998) emphasized this issue by stating that pre-service teachers do not have sufficient knowledge about the nature of science and therefore they do not prefer to integrate the curriculum into their lessons. Akerson, Buzzelli ve Donelly ise (2010) suggested that it is

necessary to cooperate with teachers who know the nature of science and can use it in the curriculum because it is thought that the wrong information that teachers have about the nature of science will cause them to reflect these misconceptions directly to their students and affect the students' perspectives on the nature of science (Mellado, 1998).

Another result obtained in the study is the opinions of the participants that scientific knowledge is provable and objective. Moreover, there are also statements indicating that science is certain, subjective, universal, and proven to be true. As for non-scientific knowledge, it was seen that they thought that it was subjective, non-evidence-based and hearsay information. It was concluded that they distinguish two types of knowledge by researching them with methods such as experiment and observation, and by looking at their accuracy. When these answers, which are also related to the epistemology of science, are examined, it can be said that the pre-service pre-school teachers have misconceptions in distinguishing scientific knowledge, and that these deficiencies are very important in terms of training individuals with 21st century skills and meeting reform expectations. When these answers, which are related to epistemological beliefs, are evaluated in general, they show that the participants have more naive epistemological beliefs about knowledge. When the literature is examined, it is seen that there are studies reporting results similar to the results obtained in the current study (Aslan, 2009; Doğan-Bora, 2005; Ryan and Aikenhead, 1992; Tanık Önal & Saylan Kırmızıgül, 2021).

In the current study, it was also seen that the pre-service pre-school teachers think that scientific knowledge is open to change. According to the participants, the reason for this change is that innovations, developments, differences, advances and scientific knowledge are not clear. Having valid beliefs and attitudes towards the development of scientific knowledge also indirectly influences views on the nature of science because the nature of science is a field that reveals beliefs about the epistemology of science and the development of scientific knowledge (Abd-El-Khalick, Bell, & Lederman, 1998; Lederman, 1992). From this point of view, it can be said that the pre-service teachers participating in the study have valid views on the change of knowledge. When the literature is examined, it is seen that similar results are obtained in studies conducted on pre-service teachers (Doğan-Bora, 2005; Küçük, 2006).

Another result obtained in the current study shows that the participants think that scientific knowledge is affected by the views of the person who reveals the knowledge. It was concluded that they think that personal ideas, feelings, interpretations and the changeable nature of knowledge cause subjectivity. Lederman (2007) and Lederman et al. (2002) mention that the work of scientists will be affected by their past experiences, lives and beliefs. For this reason, it is stated that objective observation cannot be mentioned in science. In a study conducted by Akerson, Abd-El-Khalick, and Lederman (2000) on pre-service teachers, the pre-service teachers' opinions, which were not valid in the first place about the subjectivity of scientific knowledge, changed slightly after the completion of the course and a positive progress was observed in their opinions. Similar results are also found in the study of Polat (2011).

In the current study, the opinions of the participants about the relationship between scientific knowledge and imagination and creativity were also investigated. As a result, it was seen that the participants generally think that imagination and creativity affect scientific knowledge. The participants think that imagination and creativity affect every stage of scientific studies, that they are generally more effective in the initial stage of the study, can make positive contributions to scientific knowledge and progress in science. Imagination and creativity are elements that scientists use to complete a missing piece of a puzzle, a painting, or bring new interpretations to new situations (Abd-El-Khalick, Bell and Lederman, 1998; Bell, 2009; Khishfe and Abd-El-Khalick, 2002; Lederman, 2007; McComas, 2004; Scwartz, Lederman and Crawford, 2004). Therefore, it is an important point in terms of beliefs and values about the nature of science. Polat (2011) reported results similar to the results of the current study. Akerson, Abd-El-Khalick, and Lederman (2000), on the other hand, showed in their study that

the pre-service teachers exhibited views that are not valid in the context of imagination and creativity influencing scientific knowledge before the lesson. However, as a result of the lesson given, it was observed that a positive progress was made and valid opinions were reported by the pre-service teachers. Similarly, Küçük (2006) found that while the participants initially obtained a low rate of valid answers about the imaginative and creative nature of scientific knowledge, a high percentage of valid answers were obtained after the study.

In addition, in the current study, all the pre-service teachers think that science is affected by social and cultural life. They explained the reason for this by stating that science is not independent from society and human beings, that humans are social beings, and that society and culture affect humans. It can be argued that social and cultural values affect scientific knowledge, since science is a human activity that is affected by the social and cultural values of the society in which it is practiced (Bell, 2009; Lederman, 2007, McComas, 2004; Scwartz, Lederman and Crawford, 2004). As a result of their research, Akerson et al. (2011) stated that while teaching the nature of science, it would be appropriate for teachers to start with more concrete elements such as observation and inference and move on to social and cultural ones, which are more abstract and complex elements. When the results of the current study are examined, it is seen that the pre-service teachers have valid views on this point. Akerson, Abd-El-Khalick, and Lederman (2000) observed that social and cultural values affect scientific knowledge, and that when they took the views of pre-service teachers before the lesson, they had opinions that were not valid, but after the lesson, it was stated that these opinions progressed in a slightly positive direction.

The opinions of the pre-service teachers who participated in the current study about the existence of a universal scientific method show that they think that there is such a method in general and that it is largely consisted of experiments and observations. In addition, it was concluded that they think that the reasons for using such methods are to increase the usefulness and acceptance of the study by everyone. Based on their answers, it can be concluded that the pre-service teachers have misconceptions at this point and they do not have valid opinions. "There is a general and universal scientific method" is among the myths identified by McComas (1998). Scientists do not follow a standard research plan and there is no universal scientific method. Scientists can use many different methods in their research (Bell, 2008).

Another striking result of the current study shows that the participants have misconceptions about the concepts of theory and law. The vast majority of the participants think that the theory is a concept that is unproven and changeable. They think that laws are a more precise and unchanging, proven and more effective concept than theories. From this point of view, it can be stated that a significant part of the participants have misconceptions about the concepts of theory and law, and some of them have partially valid views. Laws and theories play different roles in science. For this reason, an individual who has beliefs about the nature of advanced science should be aware that theories do not turn into laws (McComas, Clough and Almazroa, 2000). Küçük (2006) observed that the teacher involved in the study could not adequately explain the difference between theory and law.

Finally, some pre-service pre-school teachers think that theories turn into laws, that is, there is a hierarchical relationship between them. It was also observed that they think that there are some preconditions such as proving the theories and accepting their correctness by everyone in order for them to turn into laws. At this point, it is observed that the participants have an important misconception. Theories and laws are different kinds of scientific knowledge that do not transform into each other and have different functions. With new evidence emerging, both theories and laws can change (Abd-El-Khalick, Bell and Lederman, 1998; Akerson, Abd-El-Khalick, & Lederman, 2000; Bell, 2009; Lederman, 2007; Lederman et al., 2002; McComas, 2004; Scwartz, Lederman and Crawford, 2004). When the literature is examined, it is seen that there are studies having results concurring with the results of the current study (Doğan et al., 2011; Küçük, 2006). In addition, there are studies in the literature showing that the misconceptions at this point have been largely eliminated with the training

provided during the research process (Akerson, Abd-El-Khalick and Lederman, 2000; Lederman and Abd-El-Khalick, 1998; Schwartz and Lederman, 2002).

As a result, when the opinions of the pre-service pre-school teachers participating in the current study are taken into account in general, it can be stated that the participants have knowledge about the nature of science, but they also partially have misconceptions, erroneous information and deficiencies.

SUGGESTIONS

As a result of the current study, it was observed that the pre-service pre-school teachers mostly did not have correct views on the examined dimensions of the nature of science and that they had misconceptions. However, it is important for teachers to have sufficient knowledge and advanced views on the nature of science and scientific inquiry in order to train conscious individuals who are scientifically literate and have 21st century skills (Akerson, Cullen and Hanson, 2009; Lederman et al., 2014) For this reason, it is recommended to carry out new academic studies in order to eliminate the misconceptions of pre-service teachers and to improve their existing views. Thus, it can be made possible to organize undergraduate education by revealing the needs, deficiencies and misconceptions of pre-service teachers regarding the nature of science. In addition, steps can be taken for teachers and pre-service teachers to have more advanced views through postgraduate education and in-service training.

Research shows that the courses on the nature of science and scientific inquiry in the undergraduate program in Turkey are insufficient to achieve the desired results. However, there are studies showing that pre-service pre-school teachers who take courses on the nature of science and the nature of scientific inquiry have sophisticated views. For this reason, it may be suggested to improve the courses on the nature of science and scientific inquiry and/or add such courses to the undergraduate program. It can also be suggested that the courses on the nature of science should be given not only at the undergraduate level, but also at other levels of education in a way to be suitable for the relevant grade level.

With the current study, it was found out that the pre-service teachers have the perception that science is generally only for the benefit of human beings. By giving science and the nature of science to pre-service pre-school teachers as a separate course, the idea that science exists only for the benefit of human beings can be weakened and it can be ensured that pre-service pre-school teachers have more comprehensive knowledge about the nature of science. Moreover, the current study revealed that that the pre-service teachers have misconceptions about the concepts of theory and law. In the lessons to be given, these concepts can be especially emphasized and information can be given about other methods besides the experiment and observation methods. After giving theoretical information, pre-service pre-school teachers can be provided with opportunities to experience using these methods. Workshops to be focused on the nature of science will also be very effective.

Finally, it can be suggested to establish a platform for the nature of science prepared by the Ministry of National Education for primary, secondary and high schools, and by the Higher Education Council for universities. A platform that includes practices and trainings aimed at eliminating the misconceptions as well as informing about the developments and innovations revealed by new studies carried out in this field to the researchers can be beneficial in order to develop the opinions of pre-service teachers. The use of such a platform can contribute to the field in order to teach the nature of science in both formal and informal education processes.

LIMITATIONS

Like all scientific studies, this study has some limitations. First, in this study, data were collected with a questionnaire consisting of open-ended questions in order to include a relatively large number of pre-service teachers in the study. This prevented direct interaction with the participants. For this reason, it will be interesting to conduct semi-structured interviews and observations on the subject in future research, and perhaps to examine the diaries. Again, with a scale, quantitative data can be collected from a very large sample or a mixed method research can be preferred.

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Using Big Data in Education: Curriculum Review with Educational Data Mining

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Article Info	ABSTRACT
	Today, most educational institutions have become more interested in big data. Because the importance of extracting useful information from educational data to support decision-making on educational issues has increased day by day. In this context, through educational data mining, this research study aims to reveal the association rules among compulsory courses in the Computer Education and Instructional Technology curriculum within the faculty of education of a state university in Turkey. In this context, the research was conducted with data obtained from 258 preservice teachers who had completed all of their compulsory courses (n = 42) for the Computer Education and Instructional Technology curriculum, having graduated from the Computer Education and Instructional Technology program between 2012 and 2020. According to the experimental results, the academic performance of preservice teachers in some courses could be used as a predictor of their academic performance in other courses. Other findings from the study are discussed in detail, and suggestions put forth for future research.

INTRODUCTION

Today, it can be said that the amount of data produced has increased in parallel with the development of information and communication technologies (ICT) in different areas of life. For example, since the 1800s, the number of scholarly and scientific journals has doubled approximately every 20 years (Mabe, 2003), making it now possible to access vast volumes of data. By processing this "big data" into meaningful information, patterns and trends can be revealed. Although no single common definition exists, big data can be defined as datasets whose size is beyond the capability of typical database software tools to capture, store, manage, and analyze (Yin & Kaynak, 2015). However, when the literature is examined, it can be seen that certain properties (known as the "6V's of Big Data") that make up big data have been defined in order to aid our full understanding (Alkatheri et al., 2019; Baaziz & Quoniam, 2013; Bozkurt, 2016; Daniel, 2015; Yin & Kaynak, 2015): 1) "Volume"—the quantity or size of the data; 2) "Variety"—the different types of data being generated (structured, unstructured, semi-structured); 3) "Velocity"—the speed of data in and out (batch, near time, real-time, streams); 4) "Value"—the purpose or the business outcome that the data brings in, to facilitate the decision-making process (useful meaning); 5) "Veracity"—the biases, noise, and abnormality in data; and, 6) "Verification"—the data verification and security. In addition to these properties, data must be collected, analyzed, and visualized in order to unlock the value of big data (Daniel, 2015).

Big data is used in many different areas such as agriculture (Lioutas & Charatsari, 2020), education (Fischer et al., 2020), healthcare (Shilo et al., 2020), and marketing (Jabbar et al., 2020), etc. For instance, in the study conducted by Yin and Kaynak (2015), it was stated that the main purpose behind the use of big data in industrial applications is to achieve desired performance levels, especially in terms of quality, whilst ensuring that the processes are conducted fault-free and with cost-efficiency. In this context, regarding the reflection of technology in education, it was reported that more than two-thirds of the global population live in districts covered by a mobile broadband network, and that mobile technology services have become more affordable than ever before, allowing technology to be readily integrated into education (International Telecommunication Union, 2016). Furthermore, most educational institutions have become more interested in the provision of online courses (Calvet Liñán & Juan Pérez, 2015). In the United States, almost 20 million students studied in postsecondary institutions in 2017, and 6.6 million of them took some form of distance education/online learning courses, including through mobile learning (Education Data, 2021). During the COVID-19 pandemic, many countries faced various forms of lockdown in order to prevent or slow the spread of the disease, and this resulted in widespread school closures affecting more than one billion learners worldwide (Tan et al., 2020). Therefore, alternative ways were employed for the continuation of education, with various tools used that provided both synchronous (e.g., chat, audio, and/or video conferencing) and asynchronous (e.g., e-mail, forums, blogs, websites) forms of communication. In educational environments, these interactive tools are mainly used in conjunction with learning management systems (LMS) such as Blackboard, Moodle, Sakai, Schoology, and TalentLMS, etc. Thus, detailed data on students' interactions with the LMS they use, their instructors, and other students has become available (e.g., information flows, navigation patterns, number of posts created, number of posts rated, number of clicks, number of sessions, reading files, social networks, etc.) (Akçapınar et al., 2019; Calvet Liñán & Juan Pérez, 2015; Pardo & Teasley, 2014; Siemens, 2013; Tempelaar et al., 2015). Calvet Liñán and Juan Pérez (2015) stated that educational data mining (EDM) and learning analytics (LA) are two different research areas devoted to the analysis of the aforementioned data. Additionally, in a study conducted by Elias (2011), it was stated that EDM and LA are closely related.

The main purpose of EDM and LA is to extract useful information from educational data in order to support decision-making on educational issues (Calvet Liñán & Juan Pérez, 2015). When the literature in this area is examined, it can be seen that the definitions of these two concepts also support this view. The most widely used definition of LA (Bozkurt, 2016) as "the measurement, collection, analysis and

reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs" (p. 3) was put forward by the organizers of the First International Conference on Learning Analytics and Knowledge (Long et al., 2011). On the other hand, EDM has been defined as "an emerging discipline, concerned with developing methods for exploring the unique and increasingly large-scale data that come from educational settings and using those methods to better understand students, and the settings which they learn in" by the International Educational Data Mining Society (Educational Data Mining Society, 2021, n.p.). In other words, EDM is an interdisciplinary field that applies statistical, machine-learning, and data-mining algorithms with different types of educational data in order to resolve issues related to educational research (Romero & Ventura, 2010).

Siemens and Baker (2012) stated five key differences between EDM and LA, which are "discovery," "reduction and holism," "origins," "adaptation and personalization," and "techniques and methods." In a study conducted by Calvet Liñán and Juan Pérez (2015), the differences and similarities between EDM and LA were addressed, and it was argued that while the focus of EDM is more on technique and methodology, LA is more concerned with applications. Bienkowski et al. (2012) reported there being no clear distinction between EDM and LA, and whilst LA focuses on applying known predictive models within instructional systems, EDM has its focus on looking for new patterns in data and developing new algorithms and/or new models.

The current research aims to utilize EDM to examine and reveal the association rules among the compulsory courses in the Computer Education and Instructional Technology (CEIT) curriculum within a faculty of education at a state university in Turkey. In research conducted by Altun and Ateş (2008), the problems that CEIT PSTs encountered during their undergraduate training and their professional concerns for the future were examined. The study's findings indicated that problems related to the CEIT curriculum were some of the most common (Altun & Ateş, 2008). For this reason, and due to the ease of accessibility for the researchers, the CEIT undergraduate program in Turkey was examined within the scope of the current study. Especially for CEIT PSTs, the courses they take mostly examine the different educational technologies on offer and how to employ them effectively within instructional activities.

The results of this study should help instructors make their educational activities more effective with data-driven decision support tools, resulting in increased grades and retention of preservice teachers (PSTs). Moreover, PSTs at risk of dropping out can be identified through the establishment of early-warning systems, and the opportunity taken to provide the necessary precautionary measures. Furthermore, the curriculum can be examined based on the analysis outcomes and updates applied to introduce improvements where needed and appropriate. Additionally, the study is aimed at helping educational administrators and policymakers recognize how EDM can best be applied for educational improvement. The current study, along with other similar studies, aims to develop a culture of utilizing big data in the process of educational decision-making.

THEORETICAL BACKGROUND

Data-rich educational systems can provide useful feedback (e.g., actionable, informative) to policymakers, administrators, instructors, and also to students. EDM processes that deal with this big data can be described as a system that "converts raw data coming from educational systems into useful information that could potentially have a great impact on educational research and practice" (Romero & Ventura, 2010, p. 601). In other words, EDM, which is gaining increased interest on a daily basis (Romero & Ventura, 2020), emphasizes the reduction of learning to components that support decision-making (Bienkowski et al., 2012). Although EDM is considered an emerging interdisciplinary research area (Romero & Ventura, 2013), many tools (e.g., Orange, Rapidminer, etc.) used in EDM have emerged over time, and even studies such as Slater et al. (2017) have been published that have reviewed these tools.

Although predicting academic performance is one of the most popular subject areas in EDM (Akçapınar et al., 2019; Fernandes et al., 2019), researchers also utilize EDM for purposes such as the

discovery or improvement of models regarding the knowledge structure of the domain, drop-out prediction, student profiling, and achieving a deeper understanding of educational phenomena (Baker, 2011; Calders & Pechenizkiy, 2012; Romero & Ventura, 2010). In order to achieve these and similar purposes, there exists a wide variety of methods that have proven popular within EDM, and that have been subjected to different classifications by different researchers (Baker, 2011; Baker & Yacef, 2009; Bakhshinategh et al., 2018; Romero & Ventura, 2007, 2020; Zaiane, 2002). For example, in a study conducted by Baker (2011), these methods were split between five general categories: "prediction" (Fernandes et al., 2019), "clustering" (Dutt et al., 2015), "relationship mining" (Hussain et al., 2019), "discovery with models" (Baker, 2007), and the "distillation of data for human judgment" (Baker & de Carvalho, 2008). Each method of using EDM works according to different features, and each should be taken into consideration when being employed. In this context, since the current study aims to determine the association rules among the Turkish CEIT curriculum's compulsory courses, relationship mining was conducted using the apriori algorithm.

Relationship mining, which aims to discover the relationships between variables in a dataset containing a large number of variables, has four types in general: "association rule mining," "correlation mining," "sequential pattern mining," and "causal data mining" (Baker, 2011). Association rule mining is an approach that supports future studies by analyzing past data and determining the associations that occur frequently together within a given dataset (Baker, 2011; Dunham, 2003). Furthermore, although there are different algorithms ("apriori," "predictive apriori," and "tertius") it is the apriori algorithm that has proven to be one of the most popular algorithms used in the literature when it comes to association rule mining (Dongre et al., 2014), as can be seen in many previous studies (Jhang et al., 2019; Natalia & Salvatore, 2020; Wu & Zeng, 2019), and was also preferred in the current research. Another reason for electing to employ the apriori algorithm was based on the research of Shweta and Garg (2013). In their study that compared the three association rule algorithms, apriori was shown to perform better than either predictive apriori or tertiary algorithms (Shweta & Garg, 2013).

Association rules are used frequently in many areas (Dunham, 2003) such as in marketing (Abinowi & Aminudin, 2020), advertising (Joshi & Sodhi, 2014), and product placement (Cil, 2012; Putra et al., 2018), and are also used in educational studies (Acharya & Madhu, 2012; Hung & Zhang, 2008; Hussain et al., 2019; Jha & Ragha, 2013; Kılınç, 2015; Kumar & Chadha, 2012; Moubayed et al., 2018; Ougiaroglou & Paschalis, 2012; Soimart & Mookdarsanit, 2016; Wu & Zeng, 2019). For example, Wu and Zeng (2019) revealed the association rules of 34 courses according to 100 students majoring from a Computer Science and Technology department using the apriori algorithm. The results of their study showed a strong correlation to exist between certain English-related courses. Furthermore, a strong correlation was found between hardware-related courses and between courses and their prerequisites. Moreover, Wu and Zeng's (2019) study also showed that the foundation of Discrete Mathematics is also important for the achievement of high success scores for certain basic professional courses (e.g., Programming Language and Introduction to Computer Science).

In a study conducted by Soimart and Mookdarsanit (2016), an apriori-based model was designed to recommend an appropriate discipline for high school students that was consistent with their skills. The model that was developed within the scope of Soimart and Mookdarsanit's (2016) research was related to dependent variables such as the students' GPA, their interests, skills, as well as their academic scores in English, Mathematics, Computer, Science, and Social Sciences, as well as independent variables such as management, mass communication, information system, and accounting. The researchers used 3,000 samples invalidating their model and found 11 meaningful association rules with a confidence ranging from 58% to 90%.

In a study conducted by Hung and Zhang (2008), a total of 17,934 server logs were analyzed in the examination of 98 higher education students' learning behaviors within an online course so as to construct knowledge on the typical patterns of the students' online learning behaviors. As a result of their study,

active and passive learners could be differentiated through the determination of the students' behavioral patterns and preferences within online learning processes. Moreover, the researchers also stated that these results showed how EDM could be employed so as to help improve educational activities with suggestions put forward for stakeholder groups such as online instructors and instructional designers.

The general purpose of a study conducted by Kumar and Chadha (2012) was to use the apriori algorithm for association rule mining in examining students' course performance. The generated association rules revealed that different variables can influence students who do not reach a sufficient level of performance at the post-graduate level. Furthermore, their study's results showed the association rules to be very helpful both for academic administrators and for curriculum planners.

Purpose of the Study

The cycle of applying data mining in educational systems prepared by Romero and Ventura (2007) provides detailed insight into how stakeholders such as students, teachers, and education researchers can benefit from big data. For instance, knowledge revealed from the processing of data collected within educational systems (e.g., students usage and interaction data, course information, academic data, etc.) using different data mining methods can be shown to educators and/or students in offering recommendations (Romero & Ventura, 2007). Furthermore, Yang and Hu (2011) stated that by analyzing data in educational systems using the apriori algorithm, useful rules for arranging courses, quality education, and educational models can be generated. In this context, the current study was conducted in order to reveal the association rules among compulsory courses of the CEIT curriculum in Turkey, which were examined using the apriori algorithm.

METHOD

Dataset

The CEIT program was examined within the scope of this research as one of 25 teacher education bachelor's degree programs in Turkey, which are generally applied as 4-year programs (Yükseköğretim Kurulu [Turkish Council of Higher Education], 2021b). However, some universities can apply for a 1-year compulsory English language preparatory program. Furthermore, specialized bachelor's degree programs may be longer than 4 years, such as medicine which is 6 years. In the 2006-2007 academic year, certain changes were introduced by the Turkish Council of Higher Education in the curriculum of education and educational science faculties; this update included changes introduced to the curriculum of the CEIT department, which produced its first graduates in 2002.

The Turkish Council of Higher Education is the governing body responsible for all higher education institutions throughout Turkey. The Council is an autonomous institution responsible for the planning, coordination, and governance of higher education in Turkey in accordance with the Turkish Constitution and the Higher Education Laws (Turkish Council of Higher Education, 2021).

In this context, a course related to computer hardware was added to the CEIT curriculum, the number of hours allocated to physics courses were reduced, and both biology and chemistry courses were removed altogether (Altun & Ateş, 2008). As a result of this update, the CEIT curriculum, to which students were enrolled between 2008 and 2018, consisted of 49 courses, of which seven were elective (Field Knowledge [FK]: one course; General Culture [GC]: two courses; and, Vocational Knowledge [VK]: four courses) delivered over five academic semesters, as well as 42 compulsory courses (FK: 22 courses; GC: nine courses; and, VK: 11 courses) delivered over eight academic semesters (Yükseköğretim Kurulu [Turkish Council of Higher Education], 2021a).

However, in 2018, the Turkish Council of Higher Education introduced wide-reaching changes across all teacher education degree program curricula (Yükseköğretim Kurulu [Turkish Council of Higher Education], 2021b). Since the PSTs who started their undergraduate education based on the curriculum updated in 2018 have yet to graduate, the current study uses data obtained from students who studied

under the previous curriculum (i.e., prior to the 2018 update). As such, the current study was conducted with data obtained from 258 PSTs (144 female and 114 male) who graduated between 2012 and 2020 from the CEIT program at a state university in Turkey. These 258 PSTs had therefore each completed all of the compulsory courses (n = 42) in the CEIT curriculum applicable at that time. The reason why elective courses in the curriculum were not added to the dataset used within the scope of this research is that PSTs were able to choose different alternatives in their elective courses. In this context, data from 15 of the elective courses taken by the participant PSTs were removed from the dataset prior to analysis. The final version of the dataset consisted of 10,836 (42x258) records, and includes information such as student number, course code, and the students' success scores for each course.

The general purpose of the research was to determine the association rules among the compulsory courses in the CEIT curriculum. Thus, the potential effect of students' success scores on one course on other courses was investigated. The data were therefore converted into a format suitable for the examination of association rules. For each student and for each course, the data in row format were converted into column format according to the basis of each course. The dataset obtained as a result of the data conversion process is shown in Table 1.

Table 1. *The dataset*

stdId	FK Courses			GC Courses			VK Courses		
	Feature1	…	Feature22	Feature1	…	Feature9	Feature1	…	Feature11
	411111	…	418121	411441	…	417413	411311	…	418328
std1	74		86	81		61	69		100
std2	63		79	67		86	58		100
std3	66		87	69		61	69		93
std4	67		89	65		86	62		100
std5	60		63	75		64	57		85
…	…		…	…		…	…		…
std257	70		89	73		82	78		100
std258	73		91	76		83	67		100

Creating a Model

Association rules, which were first addressed in the study of Agrawal et al. (1993), are one of the first methods used in data mining. Data mining methods that analyze the co-occurrence of events are called association rules (Agrawal & Srikant, 1994). Based on these association rules, it is decided which events will occur at the same time. The current study preferred the apriori algorithm, which is one of the most popular algorithms used in association rules mining in the literature (Parack et al., 2012).

The apriori algorithm has an iterative approach (Han et al., 2011) and is used to discover sets of items frequently mentioned in databases (Agrawal & Srikant, 1994). According to the algorithm, if the k-item set (item set with k elements) provides the minimum support value, its subsets will also provide the minimum support criteria (Agrawal & Srikant, 1994). Requirements of the apriori algorithm are as follows:

- The dataset to be used must have a tabular or transactional structure. Tabular data is structured as column-based, whereas transactional data is structured as row-based. Since the data in the current study was column-based, it was considered to be of tabular structure.

- The dataset should have a categorical structure. In the current study, PSTs' successes were scored according to the marking systems (0-100). These data were categorized according to the success scores of the PSTs on the basis of the course in question.

- The directions of the variables in the dataset should be defined as "in" (input), "out" (output), or "both," with each variable in the dataset expressed as only in, out, or both. The left side of the rule is

the antecedent, while the right is consequent. In the current study, the direction of the variables was determined as "both."

$$X_{(in)} \Longrightarrow Y_{(out)} \atop Y_{(in)} \Longrightarrow X_{(out)} \bigg\} \Longrightarrow X_{(both)} \Longleftrightarrow Y_{(both)}$$

The apriori algorithm runs according to minimum support and minimum confidence parameters. The association rules among the elements are calculated with the support and confidence parameters. The greater the support and confidence parameters, the stronger the association rules. If the initial values of these parameters are too large, some rules may be overlooked; equally, if they are too small, it may lead to moving away from the desired hidden pattern.

The value of support indicates the rate of repetition of a relationship for all events, and is the percentage of combinations of the event items (Han et al., 2011). The value of support can be expressed according to the following formula:

$$Support(A \to B) = \frac{n(A \cup B)}{N}$$

A is "In" (Antecedent), B is "Out" (Consequent), and N: is the "Total number of events."

Confidence value determines the strength of relations among the events in association rules, and is the probability of Event B occurring if Event A occurs (Han et al., 2011). The value of confidence can be expressed according to the following formula:

$$Confidence(A \to B) = \frac{n(A \cup B)}{n(A)}$$

Finally, the lift value is a parameter examined where high confidence and support values exist, and is a coefficient obtained by dividing the confidence value by the support value (Han et al., 2011). The value of lift can be expressed according to following formula:

$$Lift(A \to B) = \frac{Confidence(A \to B)}{Support(A \to B)}$$

EXPERIMENTS AND RESULTS

In the current study, Orange, an open-source data mining, machine learning, and data visualization software tool, was employed for the analysis (Demšar & Zupan, 2013). In the dataset used, the CEIT courses taken by the PSTs were determined as attributes. Each measurement includes data associated with a PST. Figure 1 illustrates the workflow of the model designed for the current study.
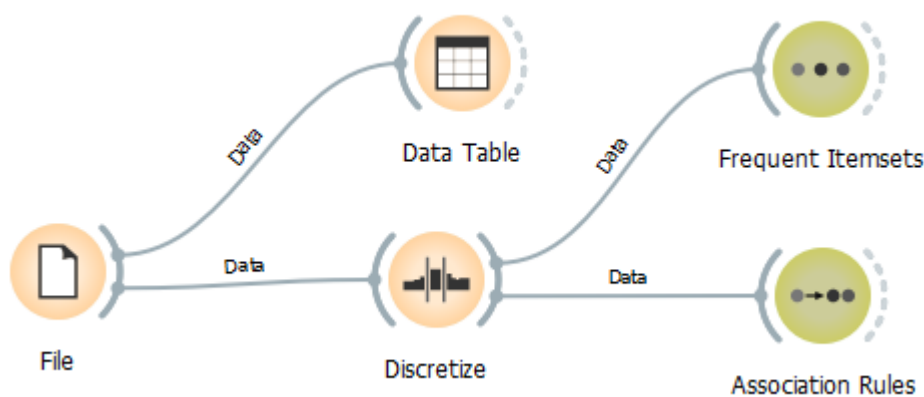

Figure 1. *Workflow of the developed model*

The basic parameters used in evaluating the model performance are support, confidence, and lift values. In the experimental process, different support and confidence values were tested, and the quality and number of association rules obtained were examined. Table 2 presents the numbers of rules obtained from different values of support and confidence parameters. These values are chosen in order to ensure that the rules are frequent and sufficiently meaningful to be taken into consideration.

Table 2. *Association rules*

Minimal support	0.10	Minimal confidence	Number of rules
		0.70	418
	FK	0.80	60
		0.85	11
		0.70	14
	GC	0.80	3
		0.85	1
		0.70	49
	VK	0.80	10
		0.85	6
Minimal confidence	0.65	Minimal support	Number of rules
		0.10	921
	FK	0.15	138
		0.20	17
		0.10	25
	GC	0.15	5
		0.20	0
		0.10	89
	VK	0.15	19
		0.20	7

According to Table 2, when the support parameter was kept constant as 0.10 and the confidence parameter values varied between 0.70 and 0.85, a minimum of 11 and a maximum of 418 rules were obtained in the FK courses category. When the confidence parameter value was kept constant at 0.65 and the support parameter values varied between 0.10 and 0.20, a minimum of 17 and a maximum of 921 rules were obtained in the FK courses category.

In the study, association rules with a minimum support value of 0.10 were determined to interpret the relations among the CEIT courses, as, for the association rules to be meaningful, at least 10% of the data must be similarly distributed. As a supplementary material, the association rules according to course categories are presented, with 60 association rules for the FK courses (s = 0.10, c = 0.80), 14 for the GC courses (s = 0.10, c = 0.70), and 49 association rules for the VK courses (s = 0.10, c = 0.70). Then, similar rules were filtered out where they were produced for the same course and with association rules in all three categories. Furthermore, association rules with similar characteristics were also removed. Example association rules with high support, confidence, and lift values are presented in Table 3a, 3b, and 3c.

Table 3a. *Association rules omitted where similar rules existed for same FK course/s (minimal support = 0.10, minimal confidence = 0.80)*

Supp	Conf	Covr	Strg	Lift	Levr	Antecedent		Consequent
0.128	0.805	0.159	2.805	1.806	0.057	415112=50.00 - 66.67, 416122=50.00 - 66.67	→	414121=50.00 - 66.67
0.124	0.800	0.155	3.750	1.376	0.034	412122=50.00 - 66.67, 413111=50.00 - 66.67	→	413114=50.00 - 66.67
0.120	0.838	0.143	3.108	1.880	0.056	413111=50.00 - 66.67, 416123=49.00 - 65.33	→	414121=50.00 - 66.67

188

Supp	Conf	Covr	Strg	Lift	Levr	Antecedent		Consequent
0.112	0.806	0.140	3.194	1.807	0.050	414124=50.00 - 66.67, 416123=49.00 - 65.33	→	414121=50.00 - 66.67
0.109	0.875	0.124	3.719	1.897	0.051	414121=≥ 83.33, 415111=≥ 83.33	→	417123=≥ 82.50
0.105	0.818	0.128	3.636	1.759	0.045	414121=50.00 - 66.67, 415111=66.67 - 83.33, 417123=66.00 - 82.50	→	415112=50.00 - 66.67
0.105	0.844	0.124	3.594	1.893	0.049	415112=50.00 - 66.67, 416123=49.00 - 65.33	→	414121=50.00 - 66.67
0.101	0.897	0.112	3.586	2.224	0.055	413112=63.33 - 79.17, 417123=66.00 - 82.50, 417111=86.67 - 93.33	→	418121=86.67 - 93.33

Table 3b. *Association rules omitted where similar rules existed for same GC course/s (minimal support = 0.10, minimal confidence = 0.70)*

Supp	Conf	Covr	Strg	Lift	Levr	Antecedent		Consequent
0.112	0.725	0.155	3.650	1.281	0.025	412422=66.00 - 82.50, 412432=66.67 - 83.33, 416412=≥ 96.00	→	411441=62.00 - 77.50
0.112	0.725	0.155	3.300	1.417	0.033	412442=66.67 - 83.33, 412422=66.00 - 82.5	→	411421=66.00 - 82.50
0.109	0.700	0.155	3.650	1.237	0.021	411421=66.00 - 82.5, 412432=66.67 - 83.33, 416412=≥ 96.00	→	411441=62.00 - 77.50
0.101	0.812	0.124	4.562	1.436	0.031	411421=66.00 - 82.50, 412422=66.00 - 82.50, 416412=≥ 96.00	→	411441=62.00 - 77.50

Table 3c. *Association rules omitted where similar rules existed for same VK course/s (minimal support = 0.10, minimal confidence = 0.70)*

Supp	Conf	Covr	Strg	Lift	Levr	Antecedent		Consequent
0.132	0.739	0.178	2.804	1.478	0.043	411310=65.33 - 81.67, 413312=≥ 81.67, 418328=≥ 97.00	→	418319=≥ 80.00
0.124	0.711	0.174	3.356	1.215	0.022	412311=63.33 - 79.17, 418319=64.00 – 80.00	→	414313=62.00 - 77.50
0.124	0.711	0.174	3.311	1.231	0.023	415314=81.67 - 89.33, 418319=≥ 80.00	→	418328=≥ 97.00
0.109	0.718	0.151	2.897	1.639	0.042	415314=74.00 - 81.67, 418319=64.00 – 80.00	→	417318=95.00 - 97.50
0.105	0.730	0.143	4.081	1.247	0.021	413312=65.33 - 81.67, 418319=≥ 80.00	→	414313=62.00 - 77.50
0.101	0.722	0.140	3.583	1.444	0.031	412311=47.50 - 63.33, 413312=≥ 81.67, 418328=≥ 97.00	→	418319=≥ 80.00

Since it is not possible to interpret all of these rules within the scope of the current study, one example has been interpreted as follows; however, other rules from the tables may also be similarly interpreted. According to Table 3a, 13% of the PSTs achieved scores ranging from 50.00 to 66.67 from the courses coded as both 415112 and 416122, and achieved scores ranging from 50.00 to 66.67 from the course coded as 414121. In addition, PSTs who achieved scores ranging from 50.00 to 66.67 from courses coded as both 415112 and 416122 showed an 80% probability of receiving scores ranging from 50.00 to 66.67 from the course coded as 414121. According to this finding, it may be stated that a PST's grade point average for courses coded as 415112 and 416122 can be used as a predictor of the grade point average for the course coded as 414121.

According to Table 3a, a strong relationship was found to exist between the software-related courses taught as part of the CEIT curriculum; for example, between "Programming Languages I" and "Programming Languages II," between "Internet-Based Programming" and "Programming Languages I/II," and between "Programming Languages I/II," and "Database Management Systems." Accordingly, it may be said that the PSTs' academic performance in the Programming Languages courses

was shown to be a predictor of their academic performance in the Database Management Systems course. However, a strong relationship was observed to exist between the Mathematics and Physics courses and the Programming Languages course. According to this finding, it may be stated that a PSTs's academic performance in courses requiring numerical intelligence such as Mathematics may affect their academic performance in software courses such as Programming Languages.

DISCUSSION AND CONCLUSION

Student information systems (SIS), in which the various forms of student information are recorded (e.g., ID, courses taken, grades, etc.) in universities and similar educational institutions, not only make things easier but also contribute to the generation of huge amounts of data. For example, Proliz Software is the most preferred SIS software in Turkey (used in more than 90 higher education institutions) and provides facilities to manage the data of more than four million students in total.

However, there are hidden patterns within this big data, hence it is necessary to attempt to obtain valuable/meaningful information from such large amounts of data in order to increase the quality of teaching and thereby to improve student learning. This outcome can be made possible through the application of various EDM methods. In this context, the current study applied the apriori algorithm to reveal the association rules among the compulsory courses of Turkey's CEIT curriculum. In other words, the association rules among the courses were investigated in order to reveal the factors that could cause high or low success scores.

According to the experimental results, a high level of positive correlation was found to exist among some courses in the current study. Also, according to the PSTs' performance in courses they had previously attended, their performance in some future courses may be estimated. In other words, the academic performance of PSTs in some courses can be used as a predictor of their academic performance in other courses. In this way, PSTs with a likelihood to fail can be identified in advance and appropriate supportive activities planned accordingly. The results also showed that the most association rules were found among the FK courses, VK courses, and GC courses, respectively.

In this study, the association rules between the courses taught in an undergraduate program were examined using the apriori algorithm. When the related literature is examined, a wide variety of studies using the apriori algorithm can be seen. For instance, Moubayed et al. (2018) examined the relationship between students' academic performances and their lesson participation with the apriori algorithm. Additionally, in a study conducted by Ko and Leu (2021), the relationship between students' self-efficacy beliefs and their academic performance was examined using the apriori algorithm, whilst Ougiaroglou and Paschalis (2012) examined the relationship among students' interest in lessons using association rules.

In the current study, a strong relationship was found between the "Mathematics II" course taught in the second semester and the "Programming Languages I" course taught in the third semester. Also, a strong relationship was found between the "Operating Systems and Applications" course in the fifth semester and the "Computer Networks and Communication" courses in the sixth semester. Similarly, Wu and Zeng (2019) found a strong relationship between a Mathematics and Programming Languages course and hardware-related courses and an Operating System and Compiling Principles course.

Furthermore, in the current research, it was observed that some courses had no association, and that the students' GPA from some courses were unable to be explained according to their GPA from other courses taken as part of the CEIT curriculum. In other words, some courses are not related to any of the other courses. This result shows that some courses taught in the curriculum were completely independent of each other. Similar results were also obtained in a limited number of studies in which the association rules between large numbers of courses were attempted to be determined (Soimart & Mookdarsanit, 2016; Wu & Zeng, 2019).

In a study conducted by Soimart and Mookdarsanit (2016), which had its focus on discipline recommendations for high-school students' future choices, 3,000 samples were studied, whilst the current study's dataset contained 10,836 undergraduate students' academic records. In other words, it can be said that the current study was conducted with a larger sample. Furthermore, in research conducted by Wu and Zeng (2019), their study attempted to determine the rules of association according to data from 34 courses taken by 100 students, whilst the current study examined data obtained from 42 courses taken by 258 PSTs. Therefore, it can be said that the dataset used in the current research was deemed to be quite large. In addition, in this study, the success points obtained in the 100-point system were categorized and analyzed. While some higher education institutions have a preference for marking-based systems, others may prefer grade-based systems (e.g., A, B, C, etc.); hence, the successes of students in marking-based systems were first converted into equivalent grading-based data.

Finally, with the association rules obtained in the current study, the academic performance of courses due to be taken forthcoming semesters can be estimated according to the academic performance in courses previous taken. On the other hand, Kumar and Chadha (2012) found beneficial relationships between graduate students' academic and their former success at the undergraduate level based on association rules. Moreover, using the current study's findings, as stated by Yang and Hu (2011), certain prerequisite courses can be determined. Furthermore, educational activities can be improved by rearranging relevant courses within the semesters. The methods and results of the current study are expected to become a point of reference, especially in curriculum improvement studies in higher education.

The current study's results do, however, present certain gaps which readers should consider. For instance, the data were obtained from 258 CEIT PSTs; therefore, larger samples or /datasets may help to reveal more effective and different association rules. Furthermore, in the current study, only the association rules for compulsory courses were attempted to be determined. Therefore, the association rules for elective courses taken by students who continued their education in different departments could also be determined in future studies.

Another point that should be mentioned here is that the courses in Turkey's CEIT curriculum were given by different instructors and within different academic semesters and years. Of course, different instructors may also have an effect on the students' grades, whilst students who started their educational life in different years will have entered university with different score levels. These and similar reasons may have had some effect on the association rules within the scope of the current research, which was studied based on data obtained for the 9-year period from 2012 to 2020.

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Preschool Pre-service Teachers' Metaphoric Perceptions of the Concept of "Environment": A Longitudinal Study

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Article Info	ABSTRACT

The study attempts to identify the perceptions of preschool pre-service teachers who take the environmental education in early childhood course about the concept of the environment through metaphor analysis. A phenomenological design, one of the most common qualitative designs, was employed in the study. The study group consists of 70 pre-service teachers in the first measurement and 49 pre-service teachers in the final measurement, who took the environmental education in early childhood course in the third year of the education faculty of a public university in the Turkey in the 2021-2022 academic year. The study was designed as a longitudinal study since the data was administrated to the participants in two stages: before they began the early childhood environmental education course (first measurement) and after they completed it (second measurement). To assess the participants' metaphors for the concept of "environment", participants were asked to complete the sentence "I think the environment is like….., because.......". Content analysis, one of the qualitative research methods, was used to analyze the data. As a result of the research, it was determined that pre-school pre-service teacher produced 48 metaphors in the first measurement and 34 metaphors in the second measurement for the concept of "environment". In the research, it was determined that the metaphors produced in the first measurement and the second measurement formed 19 categories and 12 of them were common. In the second measurement, different from the first measurement, the new categories created are 7 categories: obscurity, valuable, sensitivity, inclusive, coordination, guidance and responsibility.

INTRODUCTION

The environment is made up of interconnected ecosystems. In addition to that, there is a dynamic relationship between the environment and people in the context of change, transformation, and sustainability (Schultz, 2002). While the human life is shaped by environmental factors, the environment is also influenced by human behaviors. The sustained overuse of natural systems is closely related to the waste of natural resources and human-made waste production. This situation has resulted in many environmental challenges.

With the rise of environmental issues, one of the topics that has risen to the top of the international agenda more frequently since the early 1970s is environmental education (see, IUCN 1970; UN; 1972; UNESCO 1976; 1977; 1987). This is because environmental education encompasses a concept that can leverage national and global environmental awareness, consciousness, attitudes, and actions. In the Final Report of the International Working Meeting on Environmental Education in the School Curriculum (IUCN, 1970), published by the International Union for Conservation of Nature and Natural Resources, environmental education is defined as "a process during which values are discovered and concepts are explained in order to develop skills and attitudes pertaining to an appreciation of the relationship between man, his culture, and his biophysical environment." (p.11). Erten (2004) stipulated that environmental education along with its cognitive, psychomotor, and affective learning dimensions allows individuals to develop their environmental attitudes, whereby they also transform their attitudes into behaviors in line with the transfer of ecological knowledge. Environmental education is fundamental to addressing the social, economic, and environmental problems that are having a profound effect on us (Potter, 2009). Environmental education is as a specific skill and a way to understand the relationship between man and the living environment, which belongs not only to him, but also to plants and animals (Sabo, 2010). Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (Stapp et al., 1969).

The first intergovernmental Conference on Environmental Education, held in Tbilisi in 1977 under the auspices of UNESCO and attended by 66 member countries, provided a crucial framework for the global development of environmental education by presenting various suggestions regarding the quality, goals, guiding principles, and fundamentals of environmental education (Palmer & Neal, 1994, p.13). In this respect, the goals of environmental education are to foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas; to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment; and to create new patterns of behavior of individuals, groups, and society as a whole towards the environment (UNESCO, 1977). As a result, the categories of environmental education objectives were identified as awareness, knowledge, attitudes, skills, and participation (Hungerford, Peyton & Wilke, 1980; Hungerford & Volk, 1990). Further, it was noted that environmental education should be a continuous lifelong process; be interdisciplinary and holistic in its approach; versatile and multi-dimensional; relate environmental sensitivity, knowledge, and problem-solving skills; and examine major environmental issues from regional and international points of view (UNESCO, 1977).

The preschool period is a critical period in terms of development, learning, and behavioral acquisition. Children at this period are also more inclined to explore, discover and question the world and have a high level of intrinsic motivation to get to know the environment. In brief, it is one of the most productive times for children to develop an environmentally conscious mindset, environmental awareness, and positive attitudes and behaviors towards the environment. In this respect, raising awareness of environmental issues will be possible through qualified environmental education rooted in childhood (Akınoğlu & Sarı, 2009). One of the goals of preschool education should be to develop

conceptual knowledge about biodiversity, understand sustainability, and develop environmental attitudes (Cutter-Mackenzie et al., 2014). For this reason, qualified environmental education is a prerequisite for creating environmental consciousness and awareness among pre-service preschool teachers. The UNESCO-UNEP International Environmental Education Programme (UNESCO-UNEP 1990, p. 1) has described the preparation of teachers as "the priority of priorities" for action to improve the effectiveness of environmental education (Fien & Tilbury, 1996). Teacher training was discussed as a key component in the development of environmental education at a conference held in Moscow in 1987 and hosted jointly by UNEP (United Nations Environment Program) and UNESCO (United Nations Educational, Scientific, and Cultural Organization) (UNESCO, 1987).

One of the most important aspects of raising environmentally educated teachers is to help students develop a solid knowledge base in terms of information and content about environmental education, as well as to raise self-awareness about the subject and bring about changes in students' emotions, thoughts, and attitudes. The requirement of pre-service EE preparation cannot stand alone, but it can add to the reinforcement of teachers' beliefs that EE should be a priority in education (Plevyak, et al., 2001). This viewpoint is supported by the relevant literature on the relationship between preschool teachers' beliefs, attitudes, and classroom practices. Charlesworth et al. (1993) argued that there was a link between preschool teachers' beliefs about planning, teaching, and evaluating processes and their classroom practices. Hu et al. (2017) found a significant relationship between preschool teachers' knowledge, beliefs, and emotions and their educational practices. In addition to that, Plevyak et al. (2001) discovered differences in mandated and non-mandated EE teachers' self-confidence levels during their implementation of EE and teaching of EE concepts.

In Turkey, environmental education has been accepted as a compulsory course in the 6th semester of the Council of Higher Education (CoHE) 2018 Preschool Education Undergraduate Program under the title of Environmental Education in Early Childhood Period (spring term) (YÖK, n.d.). The course consists of three theoretical lecture hours. The catalogue content describes the environmental education course as "basic concepts about environmental education; importance of environmental education; environmental education in preschool period; planning and implementing environmental education activities for preschool children" (YÖK, n.d.). Given that education faculties are authorized by CoHE to change the curriculum (YÖK, 2020), there may be differences in universities' curricula for undergraduate preschool education. Some universities, on the other hand, continue to offer the Environmental Education in Early Childhood Education course in line with the CoHE's 2018 programme. The metaphors of preschool pre-service teachers, who took the compulsory course in the third year of the undergraduate course, about the concept of the environment were discussed with two measurements in the first and last week of the course. Given the existing literature on metaphor studies, it is seen that studies examining the metaphorical perceptions of primary, secondary, and university students about the concept of the environment have been conducted in Turkey over the last 15 years (Ateş & Karatepe, 2013; Aydın, 2011; Deniş Çeliker & Akar, 2015; Meral, Küçük & Gedik, 2016). However, no previous studies have employed a longitudinal study and more than one measurement to examine the preschool pre-service teachers' views on the concept of environment. It can thus be implied that the research is significant in terms of revealing both the perspectives of preschool pre-service teachers on the concept of the environment and the change over time using multiple measurements. It is also expected that this will help guide future studies on the subject. To recap, the study attempts to identify the perceptions of preschool pre-service teachers who take the Environmental Education in Early Childhood course about the concept of the environment through metaphor analysis. More specifically, the study sought to answer the following sub-questions:

1. Which metaphors were produced by preschool pre-service teachers regarding the concept of the environment?

2. Under which categories were the preschool pre-service teachers' metaphors classified?

3. What are the views of preschool pre-service teachers on the importance of environmental education during the early childhood period?

4. What are the views of the preschool pre-service teachers about taking another course instead of Environmental Education in the Early Childhood Period?

METHOD

Research Design

A phenomenological design, one of the most common qualitative designs, was employed in the study. The phenomenological study focuses on the everyday lived experiences of individuals within the world" (Creswell, 2018). It is intended to understand the prevalent or common experiences of people regarding the phenomenon determined in the context of the study. Understanding these experiences is critically important in terms of developing various practices and policies as well as better understanding the peculiarities of the phenomenon (Creswell, 2018). Referring to the present study, the concept of the environment was identified as a phenomenon.

The study was designed as a longitudinal study since the data was administrated to the participants in two stages: before they began the Early Childhood Environmental Education course (first measurement) and after they completed it (second measurement).

Study Group

The study group consists of 70 pre-service teachers in the first measurement and 49 pre-service teachers in the final measurement, who took the Environmental Education in Early Childhood course in the third year of the education faculty of a public university in the Turkey in the 2021-2022 academic year. The demographic data of the pre-service teachers who participated in the first measurement is detailed in Table 1, and the demographic data of the pre-service teachers who participated in the second measurement is detailed in Table 2.

Table 1. *Participant demographics in the first measurement*

Demographic data		*n*	*%*
Gender	Female	58	82.9
	Male	12	17.1
	Total	70	100.0
	18-21 years	43	61.4
	22-25 years	25	35.7
	26-33 years	2	2.9
	Total	70	100.0

From Table 1, it is seen that 82.9% of the pre-service teachers who participated in the first measurement were female (n=58) and 17.1% were male (n=12). The majority of the pre-service teachers who participated in the first measurement (n=43) are between the ages of 18 and 21.

Table 2. *Participant demographics in the second measurement*

Demographic Data		*n*	*%*
Gender	Female	40	81.6
	Male	9	18.4
	Total	49	100.0
	18-21 years	20	40.8
	22-25 years	28	57.1
	26-33 years	1	2.1
	Total	49	100.0

According to Table 2, 81.6% of the pre-service teachers participating in the second measurement were female (n=40) and 18.4% were male (n=9). The majority of the pre-service teachers participating

in the second measurement are between the ages of 22 and 25 (n=28)

Research Instruments and Processes

To assess the participants' metaphors for the concept of "environment", participants were asked to complete the sentence "I think the environment is like….., because.......". The concept of metaphor was explained to the students before the implementation, and it was emphasized that they could use their imagination and creativity when developing metaphors. The open-ended questionnaire form was administered to participants in two stages, before and after they completed the Environmental Education in Early Childhood course. In both implementations, participants were given approximately a half-hour to fill out the statement and were asked to focus on only one metaphor.

Data Analysis

Content analysis, one of the qualitative research methods, was used to analyze the data. The metaphors produced by pre-service teachers were completed in three stages (coding the metaphors, developing the categories, and ensuring validity and reliability).

1. The coding phase of the metaphors: The metaphors expressed in the participants' written materials were transferred to the computer environment, and codes were developed. Each code is given its own name in the metaphor. The reasons for choosing metaphors were transferred to the computer environment together with the coding. The coding of the metaphors was performed separately for the first and second measurement data.

2. The phase of category development: The metaphor codes were evaluated in terms of the participants' perspectives on the concept of "environment" and divided into categories. In this respect, 19 different conceptual categories were identified in the first and second measurements.

3. Validity and reliability: For the reliability of the study, the metaphor table and the categories developed in both measurements were presented to 3 experts' opinion. The data analysis process was explained in detail in accordance with qualitative research to ensure the validity of the study. In addition to that, the findings were presented both quantitatively and qualitatively through quotations from participant statements. The participants' views were expressed by the codes assigned to them by the researchers. In the first measurement, the participants were coded as "TFM…" In the second measurement, the participants were coded as "TSM…"

Ethic

The ethical committee approval was obtained from Pamukkale University, Social and Human Sciences Scientific Research and Publication Ethics Committee numbered 68282350/2022/G06 and subsequently data was collected from the students.

FINDINGS

Table 3. *Frequency values of metaphors obtained for the concept of environment in the first and second measurements*

Code	The First Measurement	*f*	The Second Measurement	*f*
1	Family	1	Tree	1
2	Lung	1	Mirror	2
3	Mother's Womb	1	Skill	1
4	Friend	1	Computer	1
5	Mirror	3	Science	1
6	Diet	1	Kidney	1
7	Brain	1	Flower	1
8	Blank notebook	1	Child	3
9	Blank sheet	1	Nature	1
10	Chameleon	1	The world	1
11	Boomerang	1	House	1
12	Skin Care	1	Migratory Birds	1
13	Flower	1	Sky	1
14	Child	1	Sun	3

Code	The First Measurement	f	The Second Measurement	f
15	The World	2	Air	1
16	Education	1	Life	4
17	Vacuum Cleaner	1	Human	3
18	House	3	Skeleton	1
19	Sapling	1	Concept Map	1
20	Sun	1	Book	1
21	World of Imagination	1	Breath	2
22	Life	2	Oxygen	2
23	Physician	1	Orchestra	1
24	Human	1	Money	1
25	Human Heart	1	Compass	1
26	Human Basis	1	Grater	1
27	Reflection of Human	1	Soap	1
28	Woman	1	Work of Art	1
29	Paper	2	Water	4
30	Book	3	Scales	1
31	Culture	1	Seed	1
32	Breath	7	Soil	1
33	Oxygen	3	Jigsaw puzzle	1
34	School	1	Chain	1
35	Ocean	1		
36	Cotton	1		
37	Grater	1		
38	Art	2		
39	Water	3		
40	Broom	1		
41	Telephone	1		
42	Seed	1		
43	Soil	3		
44	Salt	1		
45	Wagon	1		
46	Life	1		
47	Newborn baby	1		
48	Nest	1		
Total		70		49

According to Table 3, the participants developed 48 metaphors in the first measurement and the most frequently produced three metaphors for the concept of environment were breath (f=7), house (f=3), book (f=3), water (f=3), soil (f=3) and the world (f=2), life (f=2), paper (f=2), and art (f=2). Additionally, 34 metaphors were produced in the second measurement. The most frequently used three metaphors were found to be life (f=4), water (f=4), child (f=3), sun (f=3), human (f=3), mirror (f=2), breath (f=2), and oxygen (f=2).

Table 4. *Categories for the concept of "environment" (The first measurement)*

Categories	Metaphors	Frequency of the Metaphor Within the Category	Total Frequency of the Metaphor Within the Category
Care	Sapling (1), Skin Care (1), Newborn Baby (1)	3	3
Vitality	Life (1)	1	1
Diversity	The world (1)	1	1
Natural	Cotton (1)	1	1
Educational	Education (1), Book (1), School (1)	3	3
Flexibility	Chameleon (1), Paper (1), Water (1), Blank notebook (1)	4	4
Aesthetics	Art (2)	1	2
Development	Child (1)	1	1
Peace	House (1)	1	1
Necessity	Family (1), Human Heart (1), Breath (7), Oxygen (3), Home (1)	5	13
Importance	Diet (1), Flower (1), The World (1), Sun (1) Life (2), Physician (1), Water (1), Telephone (1), Soil (1), Salt (1), Wagon (1)	11	12
Diligence	Human (1)	1	1
Eternity	Book (2), Ocean (1), World of Imagination (1)	3	4

201

Categories	Metaphors	Frequency of the Metaphor Within the Category	Total Frequency of the Metaphor Within the Category
Formative	Brain (1), Human Basis (1), Grater (1), Water (1)	4	4
Cleanliness	Vacuum Cleaner (1), House (1), Paper (1), Broom (1)	4	4
Social Values	Friend (1), Culture (1)	2	2
Social Life	House (1)	1	1
Reflective	Lung (1), Mirror (3), Blank sheet (1), Boomerang (1), The reflection of Human (1), Woman (1), Seed (1), Soil (2)	8	11
Life	Mother's Womb (1)	1	1
Total		56	70

From Table 4, it is seen that the metaphors generated by participants for the concept of environment in the first measurement are combined under 19 groups. Some of the statements of the participants about each category outlined in Table 4 are presented below:

Regarding the category of care,

I think the environment is like a sapling. Just as a sapling will not grow unless it is given the necessary water and care, the environment will vanish if care and attention are not paid to it." TFM 7

Regarding the category of vitality,

"I think the environment is like life. Because it is always alive." TFM23

Regarding the category of diversity,

"The environment is like the world. Because the environment involves differences like our world." TFM14

Regarding the category of a natural,

"I think the environment is like cotton. Because it is sensitive, natural and clean. It becomes dirty and damaged as a result of our improper use." TFM60

Regarding the category of educational,

"I think the environment is like an educational book. Because it teaches us new things." TFM35

Regarding the category of flexibility,

"I think the environment is like a chameleon, because a person's environment, that is to say, every ordinary situation around her/him, is related to the environment she/he is in, and takes color and shape accordingly." TFM20

"It's like a paper. Because we can shape the paper into whatever shape we want, and by acting consciously, we can benefit the environment in a more beautiful and healthier way." TFM63

Regarding the category of aesthetics,

"I believe that the environment is like an art. Because, if we understand the environment correctly and pay real attention to it, like an artist, we can transform the environment into a work of art."TFM31

Regarding the category of development,

"It is like a child, because as it grows and develops, it becomes more beautiful and livable."TFM5

Regarding the category of peace,

"It is like our home, because we have realized during the pandemic we experienced that what we need more is our living environment that gives peace to our souls and bodies rather than the houses we live in."

TFM45

Regarding the category of necessity,

"I think the environment is like the breath. Because no living thing can live without breathing. It is critically vital for every living thing to live in an environment in which it can only live." TFM52

"I think the environment is like the breath one breathes, because without the environment, one cannot breathe and disappear." TFM68

Regarding the category of importance,

"It's like a diet. The environment is critical to our development, and it is in our hands to control it after a certain time. For instance, we can choose our own child's environment in a way that suits us." TFM47

Regarding the category of diligence,

"It's like human beings because if we don't give proper care to both, they vanish." TFM55

Regarding the category of eternity,

"It is like a huge ocean. There are numerous things, and we may encounter all kinds of things." TFM56

"It's like a vast world of imaginary because the environment is full of surprises, as if nothing is real." TFM57

Regarding the category of formative,

"I think the environment is like a grater because it changes the shape of an object. Just like the environment influences a city." TFM25

Regarding the category of cleanliness,

"I liken it to paper because the cleaner the paper, the better it can be used, but the dirtier it is, the more difficult and worse it is to use." TFM30

"The broom, because just as the broom keeps the houses clean, the environment keeps our world clean." TFM67

Regarding the category of social values,

"I think the environment is like culture because it keeps the elements of society together. It is inclusive, integrative." TFM11

Regarding the category of social life,

"I think the environment is like home. Because home is the common living place of family members where individuals live and feel comfortable. The environment is also the home of all humanity. The more sensitive we are to our environment, the more comfortable our lives will be." TFM27

Regarding the category of reflective,

"I think the environment is like a boomerang, because no matter how we treat it, it will respond to us in the same way." TFM38

"I think the environment is like a mirror of society because we can understand the sensitivity, values and cultural level of society by looking at the environment" TFM50

Regarding the category of life,

"It is like a mother's womb. Because the placenta, like the environment, provides a living space for

the baby, and many factors such as the mother's nutrition, habits, and genetic diseases are important in this living space, just as the living space we create by being environmentally sensitive." TFM59

Table 5. *Categories for the concept of "environment" (The second measurement)*

Categories	Metaphors	Frequency of the Metaphor Within the Category	Total Frequency of the Metaphor Within the Category
Care	Tree (1), Computer (1), Nature (1)	3	3
Obscurity	Children (1)	1	1
Diversity	Migratory Birds (1), Concept Map (1)	2	2
Valuable	Money (1),	1	1
Educational	Book (1)	1	1
Flexibility	Water (1)	1	1
Development	Human (1)	1	1
Sensibility	Children (1), Water (1), Scales (1)	3	3
Necessity	Skill (1), Kinsey (1), Sun (2), Air (1), Life (1), Breath (2), Oxygen (2), Water (2), Jigsaw Puzzle (1)	9	13
Inclusive	Earth (1), Life (1)	2	2
Coordination	Life (1), Orchestra (1)	2	2
Importance	Children (1), Home (1), Life (1), Skeleton (1), Chain (1)	5	5
Diligence	Science (1), Flower (1)	2	2
Guidance	Compass (1)	1	1
Eternity	Sky (1)	1	1
Responsibility	Life (1)	1	1
Formative	Grater (1)	1	1
Social Values	Artwork (1)	1	1
Reflective	Mirror (2), Sun (1), Human (1), Soap (1), Seed (1), Soil (1)	6	7
Total		44	49

When Table 5 is examined, it is seen that the metaphors developed by the participants for the concept of environment in the second measurement consist of 19 categories, which is similar to the results of the first measurement. Some of the participants' statements about each category in Table 5 are reported below:

Regarding the category of care,

"I think the environment is like a computer. Because the computer constantly needs to update itself and virus cleaning and protection are required, and the environment needs cleaning to renew itself. Many problems occur when the update, cleaning, and protection is not made." TSM40

Regarding the category of obscurity,

"It's like a child because there's so much to discover." TSM2

Regarding the category of diversity,

"I think the environment is like a concept map. Because it includes many concepts and these concepts interact with each other." TSM8

Regarding the category of valuable,

"It's like the Euro because it's gaining in value every day." TSM14

Regarding the category of educational,

"I think the environment is like a book. Because it teaches us a lot like a book. Just as we become conscious as we read a book, and find ourselves in a different world of imaginary, we learn a lot about our environment." TSM28

Regarding the category of flexibility,

"I think the environment is like liquids which take the shape of their container. Because it allows the individual to reach his/her best state and live in harmony." TSM41

Regarding the category of development,

"It is like a human. As a human being is fed, he/she develops, grows, participates in life, and becomes hope for the future." TSM9

Regarding the category of sensibility,

"It is like scales. Because when there is a deterioration in an issue that concerns the environment, the whole balance is disrupted." TSM32

Regarding the category of necessity,

"It's like the sun because the environment has an illuminating effect on us, otherwise, it makes us unlivable." TSM23

"I think the environment is like a person's kidneys. Because the kidneys act as a sieve filter in the human body. When the kidneys fail, the human body also causes harmful and waste materials to mix without passing through the filter. If the environment is not like kidneys, our world will turn into dirty and wasteful waste and become unlivable." TSM38

Regarding the category of inclusiveness,

"For me, the environment is like the world. Because it entails everything. Like our environment…" TSM16

"I think the environment is like an orchestra. Because the environment is in a harmony just like the orchestra." TSM43

Regarding the category of importance,

"It is like a house, because every pillar of the house is important to hold the house, and everything around the environment is very important to the individual." TSM46

Regarding the category of diligence,

"I think the environment is like science, because if it is valued and worked on, it becomes valuable and develops. If it is not valued, it will fall behind." TSM20

Regarding the category of guidance,

"I think the environment is like a compass, because while the compass helps us find our way, the environment helps us improve and it guides us." TSM39

Regarding the category of eternity,

"It is like the sky because it is endless…" TSM30

Regarding the category of responsibility,

"It is like life. The environment is like life, we have to fulfil some needs and responsibilities in order to live." TSM4

Regarding the category of formative,

"It's like a grater because it creates a shape." TSM42

Regarding the category of social values,

"I think the environment is like a work of art. Because a work of art reflects the values of a society and the characteristics of that society. The environment also serves this purpose in that it reflects societal values and the characteristics." TSM29

Regarding the category of reflective,

"The environment is like soap. If we use it dirty, it will not benefit us at all, but if we use it clean, the environment will benefit us in every way." TSM11

"I think the environment is like a mirror because our behavior towards the environment, good or bad, is reflected in us." TSM19

Table 6. *The comparison of the metaphor categories for the concept of "environment" in the first and second measurements*

Categories	First Measurement	Second Measurement
Care	3	3
Obscurity	0	1
Vitality	1	0
Diversity	1	2
Valuable	0	1
Natural	1	0
Educational	3	1
Flexibility	4	1
Aesthetics	2	0
Development	1	1
Sensibility	0	3
Peace	1	0
Necessity	13	13
Inclusive	0	2
Coordination	0	2
Importance	12	5
Diligence	1	2
Guidance	0	1
Eternity	4	1
Responsibility	0	1
Formative	4	1
Cleanliness	4	0
Social Values	2	1
Social Life	1	0
Reflective	11	7
Life	1	0
Total	70	49

Referring to Table 6, it is seen that the metaphors created by the pre-service teachers for the concept of environment were divided into 12 common categories (care, diversity, educational, flexibility, development, necessity, importance, care, eternity, formative, social values and reflective) in the first and second measurements. Furthermore, vitality (n=1), natural (n=1), aesthetics (n=2), peace (n=1), cleanliness (n=4), social life (n=1) and life (n=1) categories created in the first measurement were not found in the second measurement. However, unlike the first measurement, there are 7 new

categories concerning the environment in the second measurement, namely, obscurity (n=1), valuable (n=1), sensitive (n=1), inclusive (n=2), coordination (n=2), guidance (n=1) and responsibility (n=1).

Table 7. *The participants' views on the necessity of environmental course and aspire to take another course except than environmental course (The first measurement)*

Participants' Views		*n*	*%*
Views on the necessity of the environmental course	Yes (it is necessary)	68	97.1
	No (it is not necessary)	0	0.0
	Not sure	2	2.9
	Total	70	100.0
Views on the taking another course except than environmental course	Yes (I would like to take another course)	3	4.3
	No (I do not want to take another course)	54	77.1
	Undecided	13	18.6
	Total	70	100.0

As can be seen in Table 7, 97.1% of the participants in the first measurement find the environmental course necessary (n=68) whereas 77.1 % (n=54) of the pre-service teachers do not want to take any course instead of environmental course. Additionally, thirteen pre-service teachers (18.6%) are indecisive about taking another course instead of environmental course.

Table 8. *The participants' views on the necessity of environmental course and aspire to take another course except than environmental course (The second measurement).*

Participant's views		*n*	*%*
Views on the necessity of the environmental course	Yes (it is necessary)	49	100.0
	No (it is not necessary)	0	0.0
	Total	49	100.0
Views on the taking another course except than environmental course	Yes (I would like to take another lesson)	1	2.1
	No (I do not want to take another course)	46	93.7
	Undecided	2	4.2
	Total	49	100.0

According to Table 8, all of the participants in the second measurement find the environmental course necessary (n=49). 93.7 % (n=46) of the pre-service teachers do not want to take any course instead of environmental course.

DISCUSSION AND CONCLUSION

According to the findings of the study, which revealed the metaphorical perceptions of preschool pre-service teachers about the concept of environment in a longitudinal analysis, 48 metaphors were produced in the first measurement and 34 metaphors in the second measurement. Further, the metaphors generated in the first and second measurements were divided into 19 categories. 12 of the 19 categories produced in two measurements (care, diversity, educational, flexibility, development, necessity, importance, care, eternity, formative, social values, and reflective) were found to be common. As different from the first measurement, the seven new categories were produced in the second measurement, namely, obscurity, valuable, sensitivity, inclusiveness, coordination, guidance, and responsibility. In light of the findings obtained, it was found that while there was a difference between the two measurements in terms of the number of metaphors, no difference was detected in terms of the number of categories. This situation can be explained by the number of pre-service teachers who participated in the first and second measurements. It can thus be implied that the decrease in the number of pre-service teachers who participated in the second measurement might have led to the decrease in the number of metaphors. The fact that the number of categories did not change in two measurements can be interpreted as the pre-service teachers' perspective on the concept of environment remained basically unchanged. The 12 categories that remained the same in both measures (care, diversity, educational, flexibility, development, necessity, importance, care, eternity, formative, social values, and reflective) revealed various aspects of the concept of environment. Additionally, given that there is no direct literature addressing this issue, this study is of vital importance in terms of originality. Referring to previous studies, Deniş Çeliker and Akar (2015), who investigated secondary school students'

207

metaphorical perceptions of environment, reported similar categories such as "diversity, a source of life, guide, and an indispensable value." In a study conducted by Yazıcı (2013), geography teachers used metaphors such as importance, reflectivity, and diversity to describe the concept of the environment. It can thus be contended that this result is consistent with the findings of the present study. Meral, Küçük, and Gedik (2016) conducted a study on the same topic with social studies pre-service teachers and highlighted the categories of diversity, life, importance, reflectivity, beauty, and love, which are consistent with the categories of the current study. In a similar vein, Aydın (2011) conducted a study with 615 university students from various departments whereby 92 metaphors and 10 categories were produced in the study. In this respect, the categories of importance, reflectivity, life, love, and beauty can be said to overlap with the categories in the present study. In another study (Ateş & Karatepe, 2013), 250 university students from various departments participated in the study and created 150 metaphors in 9 categories related to the concept of the environment. The common categories found in this study are need, care, and formative (Ateş & Karatepe, 2013). In this study, the first three metaphors most frequently produced in the first measurement were breath (f=7), house (f=3), book (f=3), oxygen (f=3), water (f=3), soil (f=3) and the world (f=2), life (f=2), paper (f=2), art (f=2), and the first three metaphors most frequently produced in the second measurement were life (f=4), water (f=4), child (f=3), sun (f=3), human (f=3), mirror (f=2), breath (f=2) and oxygen (f=2). In a nutshell, there are common metaphors as well as metaphors that differ between the two measurements.

The new categories created in the second measurement (obscurity, valuable, sensitivity, inclusive, coordination, guidance, and responsibility), which differ from the first measurement, can be interpreted as a positive outcome of the environmental education course. It can be argued that as the knowledge levels of pre-service teachers about environmental education increase in the early childhood period, there may be an increase in their knowledge about the content, scope, and importance of the subject. This finding emphasizes the significance of environmental education practices in teacher education. Yücel et al. (2006) mentioned that students who take environmental and nature protection courses at a higher education level have more positive attitudes toward the environment than students at lower education levels. A series of previous studies have indicated that students who take environmental courses may exhibit more positive attitudes, behaviors, and sensitivities than those who do not (Aksoy & Karatekin, 2011; Değirmenci, 2012; Koç & Karatekin, 2013).

According to the research findings, explaining the environment through various metaphors reveals the multidimensionality of the concept. At this point, Kaşot (2020) drew attention to the multidimensionality and various definitions of the concept of environment. Atasoy (2015) pointed out that the concept of environment can be examined under five titles: quality, the individual's internal and external environment, geographical and spatial environment, and that each title has more than one sub-dimension. As can be seen from similar prior research, students created lots of metaphors and categories related to the environment, and there are similarities in both metaphors and categories. Metaphors allow people to reveal their perceptions of a concept using metaphors (Cerit, 2008). Thus, revealing preschool pre-service teachers' perceptions of various issues, particularly the environment, will help us better understand their perspectives as young educators.

It is seen that pre-service teachers' views about the necessity of the course and whether they want to take another course instead of Environmental Education in the Early Childhood Period differ in favor of the second measurement. A significant majority of participants thought the course was necessary in the first measurement. In the second measurement, on the other hand, all of the participants found the course necessary. While the majority of participants stated that they did not want to take another course instead of the relevant course in the first measurement, it was concluded that there were students who were undecided and wanted to take another course. The second measurement revealed a decrease in the number of students who were undecided and wanted to take another course. It is understood that the Early Childhood Education course, by means of its content and implementation method, enabled

learners to achieve targeted learning outcomes, experience and knowledge level. It is worth stating that environmental courses need to be incorporated into existing curricula to help students of all levels develop positive attitudes and behaviors toward the environment (Karakuş et al., 2016). Incorporating current issues such as technology (Çakır et al., 2019), particularly the environment, into teacher education curricula, both theoretically and practically, will improve educational quality in the short and long term. Teachers' knowledge of current issues can also boost their self-efficacy, thereby allowing for better classroom management and curriculum implementation (Durmuşoğlu Saltalı, 2022). In this sense, it is vital for teacher education to include contemporary and current issues, and pre-service teachers' knowledge levels need to be increased.

Considering the study's limitations, various suggestions for future studies and implementations can be made. This study is limited to third-grade preschool pre-service teachers at the same university. Further studies can be conducted with a larger group of pre-service teachers from various universities and classes. The study is also limited to two measurements. More measurements can be performed in future studies to investigate pre-service teachers' metaphorical perceptions over a longer period of time. It is also important to note that since the second measurement was conducted in the last course, the study was limited to those who attended the course. New arrangements can be made to maintain the same number of participants in the measurements. Besides that, this study is limited to the concept of "environment". Terms such as "environmental problems", "environmental pollution" and "global warming" may be discussed in further studies. The metaphorical perceptions of female and male pre-service teachers and teachers about the concept of environment can be compared. The number of environmental practices and courses can be increased in teacher education. Pre-school pre-service teachers can be encouraged to conduct applied environmental education with children and families. The attitudes of preschool pre-service teachers toward the environmental education course, as well as the course's effects on environmental literacy, attitudes, and behaviors, can be investigated. Pre-service teachers' perspectives on issues such as ecophobia can be investigated. The effects of environmental education practices using experimental methods can be discussed. Quantitative research can be carried out to determine the attitudes and behaviors of pre-service teachers using various variables. Longitudinal studies may provide insights into long-term environmental attitudes and perceptions among pre-service teachers. Environmental education certificate programmes and seminars can be organised for pre-service teachers.

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Student Opinions on the Order of Importance of the Root Values and in Which Course They Can be Taught Better

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Article Info	ABSTRACT
	This study which aims to reveal the opinions of secondary school students about the order of importance of root values and in which course can be better taught, was carried out with 322 secondary school students who were selected in accordance with the easily accessible sampling method during their education in the spring semester of the 2021-2022 academic year in Mamak and Çankaya districts of Ankara. The data of the study were collected with the "Idea Determination Form about in which course the root values will be taught better" and "The Form for determining the order of importance of the root values" created by the researchers. The SPSS program was used in the analysis of the data obtained from the participants by going to the schools previously determined by the researchers. In the analysis of the data, the findings part of the research was created by using the frequency values in line with the participant answers. When looking at the results of the study, it was determined that the root values that the students in the participant group considered the most important among the root values were justice, patriotism, and honesty respectively while the root values that they considered the least important were self-control, patience and responsibility. On the other hand, it was determined that the courses that the participants considered the most important in gaining the root values were respectively religious culture and moral knowledge, Turkish and social studies, and the least important courses were music, foreign language, and visual arts. Based on these results, it can be suggested that planning and implementation of regulations should be made by underlining that all the lessons in secondary schools are important and necessary in terms of root values, considering that all the root values in the programs have the same importance for individuals and they are complementary to each other.

INTRODUCTION

Since the history, the increase in the human population in general, the communication of people with each other and the activities they do together such as naturally acting together, sharing the public space together, on the other hand, the needs arising as a result of rapid advances in science and technology and increasing social confusion It has led scientists to find the principles of behavior that will provide well-being, peace and holistic living for the whole of the world, and as a result of a general effort, the importance of morality, ethics and values for societies and their benefits to society have come to the forefront (Chowdhury, 2016; Durmuşoğlu-Saltalı, 2021; Montagu, 2000).

It is seen that values emerge as a result of an individual's effort to make sense of and evaluate existence, a centrally held set of persistent dispositions that can determine both deep and environmental attitudes that tend to motivate a person's behavior (Thomas, 1997a cited in Thomas, 2005, p. 260). Elements that have become the property of the society over time and at the same time constitute the common heritage of the society (Kaymakcan & Meydan, 2020), the criteria used and desired to be reached to refer to the standards that are judged to be good or desirable for certain behaviors that act as general guides for the actions of the individual (Gökalp, 2021, p.7); Halstead & Taylor, 2000, p.169), which has an important place in the social control mechanisms in the society to perform their duties (Özensel, 2021, p.61) as well as deep-rooted beliefs that frame how individuals in society think, decide and act (Brand, 1999, p. 42), and abstract and generalized behavioral principles that arise from the emotionally strong bonds of members of a group (Theodorson & Theodorson, 1979).

There is an increasing concern in many countries in the world about the transfer of values, which have a very important mission as guiding and guiding elements in people's lives in an individual sense and as rules regulating social life in a social sense (Yazar and Lala, 2020; Fisher, 2005, p.49). This state of concern raises questions such as when, how, to what extent and where values should be transferred to future generations, and how successful they will be.

It is actually not correct to define a time and place limit for the process of transferring values to future generations. Therefore, it is known that these trainings are carried out planned or unplanned in families, religious institutions, camps, military institutions and educational institutions, starting from pre-school. While the unplanned part of the process takes place outside the school, which includes the family and the environment, the planned and programmed part takes place under the name of values education in schools which are generally educational institutions (Çalışkan and Yıldırım, 2020, p.3).

Studies on values education in recent years indicate that schools, where more efforts are made on the previous value acquisitions of individuals in the family, environment, anywhere other than school, and where sufficient confidence and self-efficacy are provided for the values of the individual, have a more active role (Cummings, 2009; Toomey, 2009, p.148).

Values education activity, which is carried out planned or unplanned in schools, which are educational institutions, inevitably takes place in every activity of schools and in almost every behavior there. For example, when teachers choose subjects and textbooks, distribute homework to students, explain their grades (Harris, 1991, p.31), become a role model for them (Kuşdil and Kağıtçıbaşı, 2000), they determine the rules of the classroom, school and any activity with the students and help the school. Values education can take place even in the behaviors exhibited by the personnel.

It would not be wrong to show the courses being taught and the program curriculum that make up the contents of those courses among the elements that have an important role in the planned and programmed values education activities in schools. It is known that the aforementioned curriculum is updated or changed from time to time in order to raise well-equipped individuals in accordance with the requirements of the age and the determined needs. In this context, changes were made in the curriculum of secondary schools in Turkey in 2018, and a title called "our values" was created to cover all the programs. Under this heading ten root values (justice, friendship, honesty, self-control, patience, respect,

love, responsibility, patriotism, benevolence) are determined and in the stage of gaining these values, "values are used both on their own and with the associated sub-values and values in the learning-teaching process and it will come to life by considering it together with other root values" (MEB, 2018) as well as general framework has been drawn about how the education of the root value will be carried out in each lesson.

It is expected that the teachers, who are responsible for the acquisition of the root values in the curriculum of the courses, will benefit from the different techniques, methods and strategies suitable for the relevant course and the subject, as well as the materials on values education, along with the approaches that have been put forward and proven effective in values education, while carrying out the values education activity (Australian Government Department of Education, Science and Traning, 2006, p.56; Usta, 2019). However, the opinions of the individuals who are aimed to gain the root values about the root values included in the curriculum of each lesson, in which lesson they should be applied, and the order of importance of these root values will undoubtedly guide them in the successful and permanent acquisition of the root values.

When the literature is examined, no study has been found on showing how primary school students perceive the root values (Yaşaroğlu and Biçer, 2020), comparing the perceptions of primary school students studying in combined and detached classes (Yarar Kaptan and Karar, 2020), examining the students' views on the values gained to the students with the social activities module (Koç Akran and Yıldız, 2020), determining primary school students' perceptions of value (Duran and Bitir, 2021) and examining secondary school students' views on the value of academic honesty (Görmez and Merey, 2022) as well as which root value should be taught more in which course. This situation constitutes the main reason for carrying out the present research. The research carried out within the framework of this basic reason was carried out in order to reveal how the secondary school students determined the order of importance of the ten root values that are common in the curricula of secondary school courses and their views on which root value can be gained in which course. In this context, it is thought that the results of the study will help teachers in gaining the root values in the curricula of secondary school courses, and will also guide the changes to be made in the curricula of the secondary school level courses.

METHOD

In this part of the study, information about the design of the current research, the study group, data collection tools and how the collected data were analyzed is given.

Research Design

The study was carried out in the screening model in accordance with the quantitative research. In the literature, it is mentioned that the survey model is a research approach that is used to make a judgment about the characteristics of a certain group or to describe a past or present situation as it is. Here, the subject or the object of the research is defined in its own conditions and as it is, without interference from outside. Researchers do not make an effort to influence or change an existing individual or object (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, and Demirel, 2010, p.16; Karasar, 2010).

Participants

The study group of the research consisted of 322 secondary school students (5, 6, 7 and 8th grade) who were studying in public schools in Mamak and Çankaya in the central districts of Ankara during spring term of the 2021-2022 academic year and the students were chosen in accordance with the easily accessible sampling method (149 boys, 173 girls). The easy accessibility in the study group can be explained by the fact that some researchers in the researcher group are working in schools in the designated districts, and some researchers have previously met the administrators and social studies teachers in the schools where the research was conducted.

Data collection tool

There are two forms in the data collection tool used in the study. In the first form (Idea determination form for which course to gain the root values better), the students were asked a question about which course they were studying at school could best gain each of the ten root values included in the curriculum of their courses. In this form, a table with ten root values is given and each root value is opposite to secondary school courses (Physical Education and Sports, Information Technologies and Software, Religious Culture and Moral Knowledge, Science, Visual Arts, Foreign Language, Mathematics, Music, Social Studies, Turkish) are given in columns. In the second form (determining the order of importance of the root values) the students are given a form with ten root values, and grading was made against the root values in order to determine the importance order of each root value for the student (1st important in the rank, 2nd important in the rank, 3rd important in the rank…., 10th important in the rank).

Data collection

Before the data of the study were collected, some of the researchers went to the predetermined schools, entered the classrooms, taking into account the appropriate conditions of the students and informed the students about the purpose of the study. In these briefings, it was stated that the study is not an exam, the answers will be used for an academic study, they are free to participate or not, and they can end the study whenever they want. Afterwards, they were informed about the first form and underlined that each of the root values in the form should be considered separately and they were asked to mark the blank spaces in the form about which course could best teach each root value. The average response time for the first form is between 5-10 minutes. Afterwards, he collected the completed forms from the participants and distributed the second form to the students. The researchers, who also carried out information activities for this distributed form, asked the students to rank from 1 to 10, which root value was more important for students, one being the most important, and 10 being the least important. Filling out this form took an average of 5 minutes. Afterwards, the participants asked the students if they had any questions they wanted to ask for this study, and they left the practice school because it was seen that no questions were asked.

Analysis of data

Both forms obtained from the students within the scope of the study were first classified separately and numbers were given to both forms. Afterwards, it was checked whether there were deficiencies in the forms and no deficiencies were found. The participants made a cooperation and completed the data entry into the SPSS 22.0 program as soon as possible. Then, the SPSS files collected by a researcher were combined into a single file and the analysis of the data was started. Frequency values, which are descriptive statistics, were used in the analysis of the data.

Ethic

We state that the study is an original study, that we act in accordance with scientific ethical principles and rules from all stages of the study, including preparation, data collection, analysis and presentation of information, that we cite all data and information that were not obtained within the scope of this study, and that we include these sources in the bibliography. We also declare that we have not made any changes and that we comply with ethical duties and responsibilities by accepting all the terms and conditions of the Committee on Publication Ethics (COPE).

FINDINGS

The opinions of the students who participated in the research on which course would be better to acquire the root values and their thoughts on the order of importance of the root values are given in the following sections. In this context, the table below presents the findings on which course will best teach the root values.

Table 1. *Participant views on which course the root values better will be taught better*

	Physical Education	Information Technologies and software	Religious Culture and Moral Knowledge	Science	Visual Arts	Foreign Language	Mathematics	Music	Social Studies	Turkish
Justice	99	70	212	70	52	62	87	57	196	162
Friendship	171	72	187	71	69	72	70	67	118	130
Honesty	89	77	250	79	54	57	84	51	103	132
Self control	124	62	137	101	76	81	86	66	107	124
Patience	99	75	196	76	83	81	109	69	102	113
Respect	129	104	245	111	113	90	117	92	145	154
Love	118	87	208	99	97	86	107	97	129	150
Responsibility	146	130	173	129	121	142	139	114	186	179
Patriotism	85	57	130	69	59	57	62	86	211	178
Benevolence	145	89	231	86	81	72	75	66	150	139
TOTAL	1205	823	1969	891	805	800	936	765	1447	1461

When we look at the table above it is seen students participating in the study think the justice root value will be taught better in the first place in the religious culture and ethics lesson, secondly in the social studies lesson, thirdly in the Turkish lesson, fourthly in the physical education and sports lesson, fifth in the mathematics lesson, sixth and seventh in information technologies and software and science course, the foreign language course in the eighth, music in the ninth and finally in the visual arts courses.

On the other hand, in line with the answers of the participants it is seen that they think friendship root value will be taught better in the first place in the religious culture and ethics lesson, secondly in physical education and sports, thirdly in Turkish lesson, fourthly in social sciences, fourthly and fifthly in information Technologies and software as well as in foreign language lesson, seventhly in science, eightly in maths lesson, visual arts in the ninth and finally in music lesson.

Considering the views of the participants on which course can best gain the root value of honesty, it was determined in the first place in the religious culture and ethics lesson, secondly in Turkish lesson, thirdly in social sciences, fourthly in physical education and sports, fifthly in mathematics, sixthly in science, seventhly in information Technologies and software, eightly in foreign language lesson, visual arts in the ninth and finally in music lesson.

It has been determined that participants who think that the root value of self-control will be gained most

216

in religious culture and ethics lessons, second in Turkish and physical education and sports lessons, third in social studies lesson, fourth in science lesson, fifth in mathematics lesson, sixth in foreign language lesson, seventh in the visual arts lesson, as the eighth in the music lesson and finally in the information technologies and software lesson.

Participants who think that the root value of patience will be gained mostly in the religious culture and ethics lesson, the relevant value can be gained secondly in the Turkish lesson, thirdly in the mathematics lesson, fourthly in the social studies lesson, fifthly in the physical education and sports lesson, sixthly in the visual arts lesson, seventh in the visual arts lesson, the eighth in science lesson, the ninth in the information technologies and software lesson and finally in the music lesson.

Considering the participant's views on which course the root value of respect can be gained the most, the related root value is mostly found in the religious culture and ethics lesson, second in the Turkish lesson, third in the social studies lesson, fourth in the physical education and sports lesson, fifth in the mathematics lesson, and sixth in the visual arts lesson, in the science lesson in the seventh, in the information technologies and software lesson in the eighth, in the music lesson in the ninth, and finally in the foreign language lesson.

When we look at the views of the participants on which course the root value of love can be gained the most, it is seen that this root value is the most in the religious culture and ethics lesson, secondly in the Turkish lesson, thirdly in the social studies lesson, fourthly in the physical education and sports lesson, fifth in the mathematics lesson, sixth in the lesson in the science course, as the seventh both in the visual arts and music course, in the information technologies and software course in the eighth place, and in the foreign language course in the ninth place.

On the other hand, when we look at the views of the participants on which course can bring the root value of responsibility the most, it is seen that the most in social studies, second in Turkish, third in religious culture and ethics, fourth in physical education and sports, fifth in foreign language, and sixth in the mathematics course, in the information technologies and software course in the seventh, in the sciences in the eighth, in the visual arts course in the ninth, and finally in the music course.

It has been determined that the participants stated that it will be taught The patriotism root value is highest in social studies, second in Turkish, third in religious culture and ethics, fourth in music, fifth in physical education and sports, sixth in science, seventh in mathematics, and eighth in visual arts, ninth in both information technologies and software and foreign language courses.

When we look at the opinions of the participants on which course the benevolence root value can be gained the most, it is seen that this root value is mostly in the religious culture and ethics lesson, secondly in the social studies lesson, thirdly in the physical education and sports lesson, fourthly in the Turkish lesson, fifthly in the information technologies and software, in science class as the sixth, in the visual arts class as the seventh, in the mathematics class as the eighth, in the foreign language class as the ninth, and finally in the music class.

Finally, when an evaluation is made about which course can gain the most ten root values, the first lesson in which the participants can gain the most ten root values is the religious culture and ethics lesson, the second Turkish lesson, the third social studies lesson, the fourth physical education and sports lesson, fifth in mathematics, sixth in science, seventh in information technologies and software, eighth in visual arts, ninth in foreign language and finally in music.

The findings showing the views of the participants about the order of importance of the root values included in the curriculum are given in the table below.

Table 2. *Participants' views on the order of importance of root values*

	Important in the 1st place	Important in the 2nd place	Important in the 3rd place	Important in the 4th place	Important in the 5th place	Important in the 6th place	Important in the 7th place	Important in the 8th place	Important in the 9th place	Important in the 10th place
Justice	97	65	48	24	23	20	12	16	17	5
Friendship	8	38	41	48	35	30	32	35	22	28
Honesty	48	49	39	48	39	27	27	22	25	9
Self control	10	5	9	21	21	21	29	32	40	132
Patience	11	13	28	19	40	38	33	35	59	48
Respect	24	45	52	31	43	42	40	21	21	5
Love	17	22	30	48	43	41	42	36	22	24
Responsibility	14	17	18	32	37	48	48	45	42	23
Patriotism	96	50	27	23	19	14	25	30	32	21
Benevolence	4	25	34	34	25	45	40	46	38	22

When looking at Table 2, it is seen that the root value that the students who participated in the study consider the first important is justice, followed by the root values such as patriotism and honesty, respectively. The root value that the participants consider the least important in the first place is the root value of benevolence. The root value that the participants consider as the second most important is again the root value of justice. This is again followed by the root values of patriotism, honesty and respect. The root value, which is considered important in the third place, is the root value of respect. This is followed by the root values of justice and friendship. While friendship, honesty and respect are among the root values considered important by the participants in the fourth place, love, respect, patience and honesty are in the fifth place, responsibility, benevolence and respect are in the sixth place, responsibility, love, respect, benevolence in the seventh place, benevolence, responsibility, love in the eighth place, patience, responsibility, self-control in the ninth place and lastly the important root values in the tenth place are self-control, patience and friendship. In general, it has been determined that the root values that the participants consider important are justice in the first place, patriotism in the second place and honesty in the third place, while the least important root values are self-control in the first place, patience in the second place and responsibility in the third place.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

Considering the results of this study, which was carried out in order to determine the students' views on the importance of these root values in which course can be better gained in the curriculum of the secondary schools since 2018, it is revealed that they think that the root values of justice, friendship, honesty, self-control, patience, respect, love are in the religious culture and ethics lesson most whereas the root values of

responsibility and patriotism can be gained in the social studies lesson the most. In addition to this, the course that the participants think can be gained in the second and third place by the root values varies depending on each root value, but Turkish and social studies courses are among the courses that students think can gain the root values.

On the other hand, it has been determined that students consider gaining root values of justice the least in foreign language, music and visual arts lessons; mathematics, visual arts and music in gaining the root value of friendship; Foreign language, visual arts and music in gaining the root value of honesty; visual arts, music and information technologies and software in gaining the root value of self-control; science, information technologies and software and music in gaining the root value of patience; information technologies and software in gaining the root value of respect; visual arts, information technologies and software, music and foreign language in gaining the root values of love and patriotism; science, visual arts and music lessons are used in gaining the root value of responsibility and mathematics, foreign language and music lessons are used in gaining the root value of benevolence.

When we look at the lessons that students consider the most important and least important in acquiring root values in general, the most important lessons regarding the root values are the religious culture and ethics lesson, the Turkish lesson is the second, and the social studies lesson is the third. In addition, the least important courses are music, foreign language and visual arts, respectively. This situation coincides with the findings of the study conducted by Özmen, Er, and Gürgil (2013) with primary school branch teachers. In the related study, teachers see religious culture and moral knowledge, social studies and Turkish lessons as the most responsible in their views on values and values education, while they see arts, music and mathematics lessons as the least responsible. In the present study, the students' stating that the root values will generally be better taught in religious culture and ethics, social studies and Turkish lessons, as well as the visual arts and music lessons among the lessons that will provide the least benefit in gaining the root values, can be considered as proof that the results of both studies overlap.

Another result that emerged in the research is on the students' views on the order of importance of the root values. In this context, the most important root value among the root values for students is the root value of justice. This root value is followed by the root values of patriotism and honesty. This situation indirectly overlaps with the results of some studies (Karatekin, Gençtürk, and Kılıçoğlu, 2013; Kılcan, 2020; Yiğittir, 2010; Yiğittir and Öcal, 2010). In the study conducted by Karatekin, Gençtürk, and Kılıçoğlu (2013) on students, teacher candidates and teachers, honesty and patriotism were among the values that were considered important at first in the value preferences of all participants. This result is in line with the results of the present study. On the other hand, in the study conducted by Kılcan (2020) with secondary school teachers, the most important root value that teachers consider is the root value of justice. Then, honesty and patriotism are among the values that are considered important. In the study conducted by Yiğittir (2010), families count patriotism and honesty among the values they most want to be taught at school. Similarly, in the study conducted by Yiğittir and Öcal (2010), the value of honesty is considered among the basic values preferred by students. Similarly, in the study conducted by Yiğittir and Öcal (2010), the value of honesty is considered among the basic values preferred by students. On the other hand, in the study conducted by Buluç and Uzun (2020) with pre-service classroom teachers, the fact that the prospective teachers consider the value of honesty the most important among the instrumental values indirectly overlaps with the findings of this study. In another study on values (Gülay Ogelman and Sarıkaya, 2015), honesty is among the most important values that preschool teachers should bring to students. The result of the study is in line with the results of this research. In the study conducted by Çelikkaya and Kürümlüoğlu (2017) for parents, students and social studies teachers, the value of fairness (justice) and honesty were shown among the most important values in the value preferences of the students participating in the research, just as in the findings of this study. Teachers and parents who participated in the same study also see the value of honesty among important values, as in the findings of this study. All these results can be considered as proof that the value of honesty is among the values preferred by both teachers and students at the beginning. In addition, when the root values that students consider the least important in

the current study, self-control, patience and responsibility root values are the values that are considered the least important by the students.

Based on all these results, it is important to organize and balance the importance of each lesson in secondary schools by taking into account the students' perspectives in gaining the root values. Of course, it cannot be expected that each root value will be gained at the same rate in every lesson. However, it is an expected situation that every lesson is taught with activities for root values. Similar points were underlined in the study conducted by Güven (2013). In the related study, the lessons in primary school were examined in terms of values and it was mentioned that there were deficiencies because a certain standard could not be established in the programs in terms of values. On the other hand, it is known that the lessons in schools are taught through books prepared based on the curriculum. In this context, it is recommended to allocate sufficient time to root values both in the preparation of the contents of the textbooks and in the teaching of the lessons through these books. On the other hand, it is recommended to include in-class and extra-curricular activities aimed at gaining root values, taking into account the integrity of the subject and course content of each course.

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The Effect of Cartoon-Enriched Instruction on Primary School Students' Academic Achievement and Attitude in Turkish Courses

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Article Info	ABSTRACT
	This study aimed to determine the effect of cartoon-enriched instruction on 4th grade primary school students' academic achievement and attitudes towards Turkish courses. The research was carried out with a total of 62 students studying in two separate fourth grade classes of a public primary school during the 2019-2020 academic year. A quasi-experimental design with pretest-posttest control group was used in the study. While the cartoon-enriched method was implemented with the students in the experimental group, regular curriculum was followed with the students in the control group. Achievement test and the attitude scale were applied to the students as a pre-test and post-test to obtain the research data. Normality tests, descriptive analyses, Mann-Whitney U and Independent Groups t-test were used in data analysis. According to the findings obtained as a result of the research, it was concluded that there was a difference between academic achievement and attitudes towards the course in favor of the experimental group, but this difference was not significant. While there was a difference in academic achievement according to gender in the experimental group students in favor of female students, there was no difference in the attitude towards the course according to gender. The research can also be applied to other courses taught in primary schools. Different humor elements can be used together with cartoons to improve students' attitude towards humor in a positive way. In the research, some acquisitions were selected and cartoons were created in a limited way. The study can be replicated by creating cartoons for all other acquisitions in Turkish courses.

INTRODUCTION

The course in which the skills related to reading and writing are most extensively taught to the students is undoubtedly the Turkish course, which covers the basic learning areas related to language teaching. Great emphasis is placed on Turkish courses in the framework of native language education during basic education. "As stated in the Turkish Language Curriculum" (Ministry of National Education (MoNE), 2018), The Turkish Language Curriculum is structured in a way that includes knowledge, skills and values so that students acquire language skills and cognitive skills related to listening/watching, speaking, reading and writing that they can use throughout their lives, develop themselves individually and socially by using these skills, communicate effectively and acquire the habit of reading and writing with interest and affinity towards the Turkish language. Şahin (2011) argued that the most important requirement of being a nation that has reached the level of modern civilization is to have individuals equipped with knowledge and skills, and that this is only possible with the acquisition of effective reading and writing skills, which form the basis of education.

Language is a bridge that transfers the culture, civilization and history of a nation to future generations, in addition to being a cornerstone that ensures the agreement and unity of the society (Şahin, 2019). The foundation for raising students' language awareness and developing language skills is laid in primary school years (Göçer, 2010; Akyol & Şahin, 2019). Language education given to students affects their achievement in Turkish courses as well as in the other courses (Yaman & Gülcan, 2009; Şahin, 2020). For this reason, it is imperative that teachers make educational environments attractive and manage the learning and teaching process well to ensure the development of language skills in students and to make them love the language (Göçer, 2010).

The materials prepared in line with the teaching environment can enrich the classrooms in student-centered education that activates the student. In addition, if the methods and techniques used appeal to more than one sense, learning becomes permanent (Kurtdede Fidan, 2008; Şahin, Girgin & Özgeçen, 2021). According to scientific research findings, through experiences, people learn 83% by seeing, 11% by hearing, 3.5% by smelling, 1.5% by touching and 1% by tasting (Çilenti, 1991; cited in Yalın, 2010: 21). Based on this information, it can be argued that the sense of sight and visual elements based on vision are crucial in the education process.

Visual and written materials are among the main technologies and materials that can be used in the classroom environment (Kaya, 2006; Şahin ve Toprak 2021). One of the visual materials that can be used during the teaching process is the cartoons (caricature) that contain humor and criticism together (Melanlıoğlu, Tayşi, & Özdemir, 2012). Written narratives presented with visuals keep attention and interest alive and are easier to analyze and interpret in the mind (Eren Ökten & Sauner, 2015). Cartoons are one of the most important visual tools that make teaching interesting (Özer, 1990). However, creating cartoons is a difficult task that requires imagination and artistic skills (Chu et al., 2021).

A cartoon is a thought-provoking and humorous picture that exaggerates all kinds of events related to human and society (TDK, 2021). Cartoons have changed over the years in terms of their subjects and drawing styles. However, they have been a part of our lives in every way and they are used in different areas such as newspapers, magazines and posters. In recent years, cartoons are included in textbooks as well. Cartoons are among the visual materials that can be used in Turkish courses (Özdemir, 2019). As a matter of fact, the achievements related to the interpretation of cartoons are included in the Turkish curriculum in Türkiye (MoNE, 2017; MoNE, 2018, MoNE, 2019).

According to Özer (1998), a total of four elements are significant in cartoons: irony/humor, exaggeration, drawing and making people think (Cited by Göçer & Akgül, 2018). Thanks to the irony/humor element, even boring subjects can be easily grasped by the student. Cartoons guide students to explore and strengthen their sense of curiosity (Koç Akran & Kocaman, 2018). The activities of thinking, analyzing, interpreting and reaching a conclusion, which form the basis of cartoon

art, overlap with the aims of education (Melanlıoğlu et al., 2012). In addition, permanent learning is provided with the help of the cartoons which offer more visual content and the subjects are concretized because they appeal to more than one sense organ (Saat, Er & Üstün, 2018). Educational environments where cartoons are used are more interesting for both teachers and students, and students participate in the course more willingly. Thus, the use of cartoons in courses positively affects students' motivation and achievement (Bayülgen, 2011).

With the help of cartoons, students can criticize themselves and their environment in educational settings (Koç Akran & Kocaman, 2018). By activating their focus, interests and curiosity, cartoons help to ensure that students start the course with different ideas (Melanlıoğlu et al., 2012). Cartoons, which are among the visual elements, also facilitate the understanding of complex and abstract subjects. Based on these benefits, educators should know the irony technique of the art of cartoons, what is meant and its characteristics (Özer, 1990) in order to popularize the use of cartoons in educational environments.

Literature review shows that many studies emphasized the positive aspects of using cartoons. For example, Eren Ökten & Sauner (2015) stated that using illustrated texts and visual content in language education improves reading, effective use of language, critical thinking and interpretation skills. In addition, they reported that grammar subjects are taught more easily, entertainingly and quickly with cartoons, advertisements, illustrated anecdotes, and comics and students understand linguistic forms and meanings more easily along with their cultural dimensions. Bayülgen (2011) found that cartoons used for teaching purposes increase fun, facilitate learning, recall, creative thinking, concretization and increase motivation towards the course. In their research, Varışoğlu, Şeref, Gedik &Yılmaz (2014) concluded that the teaching technique with cartoons is effective in teaching idioms and proverbs. Temizkan (2011) emphasized that drawing cartoons of heroes in novels, stories and fairy tales read together in the classroom and using them for communication is beneficial in the field of learning reading.

Enriched course environments increase student interest in the course. It is known that educational environments where students can express themselves comfortably also affect their attitudes towards the course positively (Savaş, 2014). For this reason, it is believed that the use of cartoons is important in mother tongue teaching. It is thought that cartoons will positively affect student attitudes towards the course, as they contain visual and humorous elements, and thus, students' academic achievement can be increased. It is believed that students who are successful in Turkish courses will also increase their self-confidence, their social communication skills will develop positively, and it will contribute to their achievement in other courses.

Based on these views, the problem statement of this study was selected as follows: "Is there a significant difference between the attitudes and academic achievement levels of the fourth grade students in the Turkish course who receive cartoon-enriched instruction and who receive regular instruction by following the MoNE curriculum?" Answers to the following sub-problems were sought in line with this problem:

1. Is there a significant difference between the Turkish course academic achievement post-test scores of the students who received cartoon-enriched instruction in the Turkish course and those who studied within the scope of the MoNE curriculum?

2.Is there a significant difference between the Turkish course attitude post-test scores of the students who received cartoon-enriched instruction in the Turkish course and those who studied within the scope of the MoNE curriculum?

3. Is there a significant difference between the academic achievement and attitude post-test scores of the students who received cartoon-enriched instruction in the Turkish course based on gender?

METHOD

Research Design

A quasi-experimental model with pretest-posttest control group, which is one of the quantitative approaches, was used in this study. This model includes experimental and control groups which are assigned randomly and measurements are made before and after the experimental procedure in both groups (Karasar, 2009). If the average scores of the groups differ in the test, this gives an idea about the effectiveness of the methods (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz & Demirel, 2022). In the study, experimental group was taught with cartoon-enriched instruction while the control group was taught by following the MoNE curriculum.

Table 1. *Research model (Pretest-Posttest control group model)*

Group	Pre-test	Experimental Procedure	Post-test
G1	At1	X	At2
	Ac1		Ac2
G2	At1		At2
	Ac1		Ac2

In the above table; G1 is the experimental group, G2 is the control group, At1 is the attitude scale pre-test, At2 is the attitude scale post-test, Ac1 is the course achievement pre-test, and Ac2 is the course achievement post-test.

Research Sample/Study Group/Participants

The universe of this research consisted of students who continued their education in the fourth grade of primary schools in a city center in the Central Anatolia Region in the 2019-2020 academic year. The research sample was composed of students who attended two separate fourth grade classes in a primary school in this city center. Since the sample was chosen from the students in the primary school where one of the researchers worked, the convenient sampling method was preferred among the non-random sampling methods. According to Büyüköztürk et al. (2022), convenient sampling is gathering data from a sample that the researcher can easily reach. The experimental group included a total of 30 students, 17 girls and 13 boys, while the control group was composed of a total of 32 students, 13 girls and 19 boys. A total of 62 students participated in the study. The school, where the experimental and control groups were formed, has a total of nine fourth grade classes. Among these nine classes, two classes were selected based on the similarity of socio-economic and academic achievement levels and their willingness to participate in the study on a voluntary basis. The method of drawing lots was used to identfy the experimental and control classes from these two classes selected as the sample. Table 2 presents the demographic information about the study sample.

Table 2. *Participants' demographic information*

Variable		Experimental Group		Control Group	
		f	%	f	%
Gender	Female	17	56,7	13	40,6
	Male	13	43,3	19	59,4
	Total	30	100	32	100
Maternal Educational Level	Primary school degree	11	36,7	9	28,1
	High school degree	15	50,0	12	37,5
	University degree	4	13,3	11	34,4
	Total	30	100	32	100
Paternal Educational Level	Primary school degree	4	13,3	4	12,5
	High school degree	17	56,7	18	56,3
	University degree	9	30,00	10	31,3
	Total	30	100	32	100

According to Table 2, female students constituted 56.3% of the group, while male students constituted 43.3% in the distribution of the students constituting the experimental group of the research

by gender. Male students made up 59.4% of the control group students, while female students made up 40.6% in the control group. When the educational status of the parents of the students in the experimental and control groups was examined, it was seen that the majority of them were high school graduates.

The Turkish Course Achievement Test was applied in this study as a pre-test to determine the academic achievement of the groups before the experimental procedure. Kolmogorov-Smirnov test was performed to check whether the pre-test results showed a normal distribution. According to the normality test results of the groups, it was seen that the data did not show normal distribution (p<.05). Since the data did not show normal distribution, Mann-Whitney U test was used. It was found that there was no significant difference between the two groups according to the calculated Mann-Whitney U value and the level of significance in the 95% confidence interval (U= 445,500; p>0.05). This finding was interpreted as that the experimental and control groups were equal to each other in terms of course achievement scores before the research.

In the study, the Scale of Attitude towards the Turkish Course was given as a pre-test to determine the equivalence of the groups in terms of their attitudes towards the course before the experimental procedure. Kolmogorov-Smirnov test was performed to check whether the pre-test results showed a normal distribution. According to the normality test results of the groups, the data showed normal distribution (p>.05). Since the data showed normal distribution, independent groups t-test was performed. It was found that there was no significant difference according to experimental and control groups' course attitude scale pre-test scores (t(60) = -,114; p>0,05). This finding showed that the experimental and control groups were equal in terms of their attitudes towards the course before the research.

Research Instruments and Processes

Turkish Course achievement test

The achievement test was developed by the researchers in accordance with the acquisitions in the fourth grade Turkish course curriculum. As the first step, the curriculum was examined and the subjects and acquisitions that would form the basis of the research were identified. While selecting the acquisitions, examples that were suitable for visualization and cartoons for speaking, reading comprehension and writing skills were selected. The acquisitions of the fourth grade Turkish course in the 2018 Turkish Curriculum, textbooks and reference books were examined after the Table of Specifications was prepared. The achievement test, which was prepared to evaluate the acquisitions in the fourth grades by using the relevant resources, was prepared in draft form with 56 questions. The number of questions was reduced to 39 after expert opinions. The achievement test, which took its final form with 39 questions, was piloted with 146 participants studying in the fifth grade and analyzed in the SPSS program. The item difficulty indexes of the 4., 6., 15., 18., 19., 24., 29., 37. questions were found to be low so they were excluded; 2., 5., 20., 23., 34., 35., 36. questions were excluded from the test as well due to low discrimination indices and 8., 13., 38. and 39. questions were also excluded due to low item total correlation and Alpha reliability coefficients. Hence, the test was finalized with 20 questions.

Scale of attitude towards the Turkish Course

The "Scale of Attitude towards the Turkish Course" developed by Topçuoğlu Ünal and Köse (2014) was used to measure student attitudes towards the course. The 5-point Likert type scale consists of 27 items. The Cronbach's Alpha reliability coefficient of the scale was found to be ,914 by the researchers. The validity of the scale was also demonstrated with the results of exploratory and confirmatory factor analyzes. Necessary permissions were obtained before using the scale. In the scale, 19 items have statements related to positive attitudes and 8 items have statements related to negative attitudes. The scale was applied to the experimental and control group students as pre-test and post-test. The Cronbach's Alpha reliability coefficient of the scale applied as a pre-test before the procedure was

,878; while the Cronbach's Alpha reliability coefficient of the scale was found to be .904 when it was applied as a post-test after the procedure.

Data Analysis

The data were analyzed in SPSS program and compared at $p \leq 0.05$ significance level. The normal distribution of the data was examined by Kolmogorov-Smirnov and Shapiro-Wilk tests. Descriptive analyzes were performed with Mann-Whitney U, Independent Groups t-test in the research.

Implementation Process

The cartoons used in the research were drawn by the researchers. Before the cartoons were drawn, the researchers watched educational videos about drawing cartoons and examined the cartoons used in education and the cartoons that were used in previous scientific researches related to this subject. The literature on the use of cartoons in education and training was reviewed to have preliminary knowledge of cartoon drawing. Then, the course curriculum acquisitions were examined to identify which acquisitions would be more appropriate for using cartoons. While determining the learning acquisitions, 11 were selected as suitable for visualization and cartoon drawing. Cartoon drafts were created and expert opinions were consulted in accordance with the selected acquisitions and necessary modifications were made after receiving expert opinions. The completed cartoons were transferred to the computer environment and printed out in color. Some of the created cartoons were drawn for more than one acquisition.

These prepared cartoons (61 in total) were implemented to the experimental group students for one course per week for 13 weeks. The control group students continued their education and training in the manner required by the curriculum. The professional seniority of the classroom teacher in the experimental group was 17 years, and that of the classroom teacher in the control group was 24 years during the time of the study. Both teachers were females. The academic achievement and attitude levels of the experimental and control group students were measured before and after the procedures.

The subject to be covered in the course was explained to the students verbally and in writing. Students were divided into groups in a manner where each group received a cartoon. The cartoons selected in accordance with the relevant acquisition were distributed to these groups. The groups were given five minutes to analyze the cartoons. Then, the cartoons were exchanged between the groups. Each group was given the opportunity to examine each cartoon, to identify examples suitable for the subject and to take notes on these examples. Later, the selected group members were given the opportunity to express the examples in the cartoons. Particular attention was paid to have each group member talk about a cartoon so that each student could have a say. Meanwhile, the cartoon the students were discussing was projected onto the wall by using a projection. Thus, it was ensured that each student in the class could see and notice the example. Meanwhile, the examples given by the student were shown by the class teacher.

The humor/irony of the characters and the story in the cartoons were presented by the guidance of the teacher. A fun teaching atmosphere was created by using different jokes and witticisms. Then, the cartoons projected on the wall were thoroughly examined with the teacher's guiding questions and the students became more active in the course. Students read the speech bubbles in the cartoons and sometimes they were asked to act them out. The classroom teacher asked guiding questions so that the students recognized the rules and examples related to Turkish in the sentences in the speech bubbles. Then the students were asked to provide different examples. The examples given by the students were evaluated in the classroom environment and feedback was received to understand whether the subject was fully comprehended. In addition, examples related to the topics previously covered in the cartoons were found by the students with the help of the classroom teacher's guiding questions. Cartoons suitable for drama demonstration were acted out by student groups. Figure 1 presents an example of a cartoon prepared for the acquisition: Finds synonyms for words:

Figure 1. *Sample cartoon*

FINDINGS

Findings on Academic Achievement

The independent groups t-test was performed since the data showed normal distribution when tested to see whether there was a significant difference between the scores of the experimental and control group students in the academic achievement test after the experimental procedure. Table 3 present these results.

Table 3. *Independent groups t-test results based on academic achievement post-test scores*

Group	n	$\bar{X}$	S	sd	t	p
Control Group	32	63,91	17,03	60	-,369	,713
Experimental Group	30	65,50	16,94			

According to Table 3, there was no significant difference in experimental and control groups' academic achievement post-test scores (p>0,05). It was found that the arithmetic average of the academic achievement post-test scores of the students who receive cartoon-enriched instruction was higher than the other students, but this difference was not statistically significant.

Findings Related to the Attitude towards the Course

Since the data did not show normal distribution, Mann-Whitney U test was performed to test whether there was a significant difference between the scores of the students in the experimental and control groups after the experimental procedure. Table 4 presents these results.

Table 4. *Mann-Whitney U Test results based on attitude scale post-test scores*

Group	n	Mean Rank	Rank Sum	U	p
Control Group	32	29,81	954,00	426,000	,447
Experimental Group	30	33,30	999,00		

According to Table 4, there was no significant difference in the experimental and control groups' post-test attitude scores (p>0,05). It was found that the academic achievement post-test mean score of the students who received cartoon-enriched instruction was higher than the other students, but this difference was not statistically significant.

Findings Related to Gender Variable in Academic Achievement and Attitude towards the Course

Since the academic achievement and attitude post-test scores of the students who received

228

cartoon-enriched instruction did not show a normal distribution according to gender, the Man-Whitney U Test was used to determine whether there was a difference.

Table 5. *Mann-Whitney U Test results of academic achievement and attitude scores by gender*

Variable	Group	n	Mean Rank	Rank Sum	U	p
Achievement	Female	17	18,35	312,00	62,000	,040
	Male	13	11,77	153,00		
Attitude	Female	17	17,09	290,50	83,500	,258
	Male	13	13,42	174,50		

According to Table 5, a significant difference was found between the academic achievement post-test scores of the students who received cartoon-enriched instruction according to gender ($p<0,05$). Considering the mean rank, it was found that the mean rank of female students was higher than that of male students. Accordingly, it can be argued that female students' academic achievement in cartoon-enriched instruction was significantly higher than that of male students. There was no significant difference between the levels of attitude towards the course and the post-test scores according to gender ($p>0,05$). In other words, attitude towards the course did not change according to gender when students received cartoon-enriched instruction.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

As a result of the research, no statistically significant difference was found between the academic achievement levels and attitudes of the students in Turkish course whether they studied under the curriculum of the MoNE or received cartoon-enriched instruction. It was concluded that the academic achievement post-test mean scores of the students who received cartoon-enriched instruction was higher than the mean of the students who studied within the scope of the MoNE curriculum, but this difference was not statistically significant. This result may be related to the insufficient knowledge and experience of the classroom teacher who participated in the study about using humor, a lack of sense of humor, or inability to use cartoons in the classroom in an adequate and appropriate manner.

Due to the scarcity of studies on using cartoon-enriched instruction in Turkish courses, studies based on using cartoons were examined for other courses. Parallel findings were reached in some other studies that are similar to the results obtained in this study. There are studies that conclude that cartoon-enriched instruction does not affect academic achievement in science education, geography education, and science and technology teaching (Demirel & Aslan, 2014; Şeyihoğlu & Şahin, 2019; Yılmaz, 2020).

On the other hand, here are also studies in the literature that do not support these results. Yılmaz, Yaşar Sağlık & Kadan (2021) determined that the speaking skills of the group of students taught with concept cartoons were significantly better in the "language and expression", "content" and "presentation" dimensions. Syamsuri, Muhsin, and Nurmayani (2016) concluded that the use of cartoons has an effect on learning writing. Research also concluded that teaching with cartoons is more effective in teaching proverbs and idioms compared to the current curriculum (Varışoğlu et al. 2014). There are also studies that conclude that cartoon-enriched instruction increases academic achievement in science courses (Çetinkaya, Gök & Yalkın, 2022; Kaya, Özay Köse & Konu, 2016; Kocakavak & Erökten, 2021; Ocak, Güleç Islak & Ocak, 2015; Yılmaz Korkut & Şaşmaz Ören, 2018; Yurttadur & Pehlivan, 2020); in science and technology teaching (Başarmak & Mahiroğlu, 2016; Evrekli & Balım, 2010); in science, technology, engineering and mathematics education (Ergün & Külekçi, 2020); in social studies courses (Ada & Sözen, 2021; Tokcan & Alkan, 2013); in mathematics teaching (Katipoğlu, Eken, & Körbay, 2017; Karaca, Kuzu, & Çalışkan, 2020) and grammar teaching (Akkaya, 2011).

It was determined that the post-test scores of the students taught with cartoon-enriched instruction were higher than the students studying following the MoNE curriculum, but this difference was not

statistically significant. This result may be related to limiting the weekly course hours taught with cartoons to one hour, insufficient implementation time and the low number of cartoons used in classes. Literature review presented studies in parallel with the finding that cartoon-enriched instruction did not significantly affect the attitude towards the course. Başarmak and Mahiroğlu (2016) concluded that cartoon-enriched instruction did not affect the attitude towards humor. There are also studies in the literature that do not support these results. There are studies in the literature that have found that cartoon-enriched instruction positively affected students' attitudes towards the course. Çetinkaya et al. (2022) concluded that the use of concept cartoons increased the attitude towards science courses. Savaş (2014) reported that the use of humor (via anecdotes, humorous stories, memoirs, photos and cartoons) in Turkish courses increased the attitude towards the course. Akkaya (2011) also found that the use of cartoons in grammar teaching increases the attitude towards the course in Turkish courses.

Based on gender, there was a significant difference between the academic achievement post-test scores of the students receiving cartoon-enriched instruction in favor of girls. However, there was no significant difference between post-test attitude scores by gender. There are studies with similar findings. Similar to the results of this research, Şahin and Keşan (2022) concluded that female students' achievement in geometry supported by concept cartoons was higher than that of male students, and their attitudes towards the course, but unlike the result of this research, female students had more positive attitudes compared to boys. Ocak et al. (2015), on the other hand, concluded that there was no significant gender difference in academic achievement when concept cartoons were used in science courses.

Considering that it takes longer for students to change their attitudes towards a course, it may be recommended for similar studies to keep the practice time longer or to allocate more course hours to practice during the week. The research can also be applied to other courses taught in primary schools. Different humor elements can be used together with cartoons to improve students' attitude towards humor in a positive way. In the research, some acquisitions were selected and cartoons were created in a limited way. The study can be replicated by creating cartoons for all other acquisitions in Turkish courses.

Seminars can be organized for teachers on the preparation of cartoons and their use in courses. Acquisitions including cartoons and humor can be included in the curriculum. Elements containing humor and cartoons can be included more among the visuals in the textbooks.

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Examining the past of distance education and the views of faculty members on the present and future

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Article Info	ABSTRACT
	After examining the historical development of distance education through the relevant literature, the purpose of this study is to examine faculty members' views on the current situation and future expectations. The phenomenology method, one of the qualitative research methods, was used for the study. 11 lecturers who taught via distance education at a university during the Covid 19 pandemic participated in the research. Semi-structured interview questions were used as an instrument for data collection. Distance or face-to-face interviews were conducted with the participants for the research purpose. The interviews were analyzed using the content analysis technique. As a result of the analysis, opinions were grouped under six headings: Applications in Distance Education, Advantages of Distance Education, Useful Aspects of Distance Education, Problems in Distance Education, Requirements in Distance Education, and Its Future in Distance Education. The prominent results of the research are discussed in the discussion section. When these prominent results are considered, for learning management system developers; problems experienced in the system, and features that should be added, for researchers; It can be stated that it is a guide for future experimental studies. It is recommended to support the advantages and useful aspects, meet the requirements, conduct research to solve the problems experienced, and conduct studies to meet the expectations for the future.

INTRODUCTION

Education is the process of creating a deliberate change in the behavior of individuals through their own experiences (Ertürk, 1975). These behavioral changes may differ over time in line with the needs of individuals and societies. For example, the skills needed by individuals in society 100 years ago and the skills needed today are quite different. If the educational needs are not determined correctly, the information that individuals will learn may not meet the needs of society, causing education to be ineffective. Many parents think that a good education will provide their children with the skills and tools to meet their needs for a lifetime (Miller, 2000). Considering the rapidly developing technology, conditions, and changing needs depending on these, when the recent periods are examined, it is not possible to meet lifelong needs with a uniform education. For individuals to adapt to rapid changes, it is considered necessary to receive education according to the conditions and needs of their age throughout their lives (Güleç, Çelik & Demirhan, 2012). This situation reveals the importance of lifelong learning. Distance education plays an important role in meeting the new needs emerging within the scope of lifelong learning.

In this study, after examining what distance education is and its historical development process based on a literature review, opinions and suggestions will be made about its current structure and new technologies that can be used in the future, taking into account the opinions of instructors with distance education experience. In line with these examinations, opinions on the definition of distance education, its history, its current structure, and new technologies that can be used in the future will be made.

Literature Review

Distance Education

Distance education first appeared in the Boston newspaper in 1728 with "Shortcut lessons" (Holmberg, 2005). This concept is defined in different ways in the literature. However, according to the generally accepted definition, distance education is generally accepted as a structured learning experience that can be done from an academic institution, at home, or work (McIsaac & Gunawardena, 1996). İşman (1998) defines it as an education system in which the learning-teaching processes of students and instructors in different environments are carried out through mail or communication technologies. A different definition was made by Uşun (2006). According to Uşun, it is a planned, systematic educational technology application in which interaction between the source and the receiver is ensured by using written, printed, audio and technological tools that allow flexible and independent learning following individual characteristics in a large part of the learning-teaching processes of the source and the receiver.

McIsaac and Gunawardena, (1996) distance education are traditionally defined as teaching through printed or electronic communication tools to people who are doing planned learning in a different place or time than the instructor or trainers.

When various dictionaries are examined, the definitions of distance education are as follows:

- It is a form of study in which you study from where you live without going to a school, college, or university, where you are usually taught something and given work to be done about what has been taught (Cambridge Dictionary, 2021). In addition, the terms "Distance Education" and "Distance Learning" are defined as synonyms in the Cambridge dictionary.

- Internet, e-mail, mail, etc. where teachers or students do not meet in the classroom, but to take lessons. It is a working method in which they use communication methods (Merriam-Webster, 2021). In this dictionary, the concepts of distance education and distance learning are defined as variants of each other.

- Instead of going to school, students can share their course content with videos, etc. on the internet. It is the form of education they receive with tools (Dictionary.com, 2021). In this

dictionary, the concepts of distance education and distance learning are defined in the same way.

- It is a method of study in which lectures are published or lectures are conducted by correspondence, without the need for the student to go to a school or college (Lexico, 2021). The Lexico dictionary includes the concept of distance learning. However, the definition of distance education could not be found.

- In the dictionary of the Turkish Language Institution, distance education is defined as "a form of education conducted from a certain center by using various communication tools without being face-to-face between the student and the teacher" (TDK Sözlük, 2021).

Considering the definitions in different dictionaries, there are common points in the definitions of distance education. These:

- Students and teachers being in separate places,

- Sharing educational content through different communication channels such as mail, e-mail, radio, television, and internet applications.

- It is to enable students to learn by working on the shared course content.

When the definitions in the dictionaries are compared, the results are similar to the six basic elements of distance education made by Desmond Keegan (1980). According to Keegan (1980), the six basic elements of distance education are as follows:

- Separation of teacher and student

- Impact of an educational institution

- Use of media to connect teacher and student

- Providing two-way communication

- Students are individuals rather than a group.

- An industrialized form of education

Developmental Stages of Distance Education

When the stages related to distance education are examined, it is seen that technological developments play a decisive role in the formation of these stages (Akyürek, 2020). Developments in technology affect education and training processes as well as in all areas of life. In this context, there has been a transition from printed sources to electronic sources in education processes over time (Gülbahar, 2012). These transition processes also affect distance education. Distance education, which started with the giving of distance shorthand lessons in the Boston newspaper in 1728, has been divided into 5 stages in the historical development process (Moore & Kearsley, 2012). These phases are as follows:

1. Correspondence Phase (Letter, mail, etc.)

2. Radio and Television Broadcasts

3. Open Universities

4. Teleconference Systems

5. Internet and Web Technology

Correspondence Phase (Letter, mail, etc.)

In the early 1880s, cheap and reliable postal services emerged as a result of the spread of railway transportation to large regions. As a result of these services, people wanted to learn at home or work using the teaching materials delivered to them from a distant teacher. In this context, over 200 letter teaching schools were opened between 1890 and 1930 (Moore & Kearsley, 2012).

Radio and Television Broadcasts

Radio emerged as a new technology at the beginning of the 20th century. He obtained his first educational radio license at Salt Lake City University in 1921 (Saettler, 1990). Later, the Iowa public university started to offer lectures on its radio station, and 80 students were enrolled in the first course opened (Pittman, 1986).

Educational television broadcasts started in 1932-1937 (Uşun, 2006). In those years, Iowa public university lectures on oral hygiene and astronomy were presented via television. About 400 educational programs were broadcast from the university's broadcast station until 1939 (Unwin & McAleese, 1988).

Information via radio and television broadcasts is transmitted faster than information transmitted by mail. However, there is still a lack of mutual communication. This shortcoming can be remedied by mail.

Open Universities

In the late 1960s and early 1970s, a critical period was experienced for distance education. The idea of an open university emerged as a result of several experiments with new ways of combining human resources and technology, led by new educational theories and teaching techniques. The most important examples of this concept are the University of Wisconsin's AIM project (Articulated Instructional Media) and the Open University of Great Britain.

The AIM project is a project led by Charles Wedemeyer and funded by the Carnegie company. It aims to deliver high-quality inexpensive teaching materials to off-campus students using various communication technologies. The technologies they use are printed study guides, postal mentoring, educational radio and television programs, recorded audio tapes, telephone conferences, material packages for home experiments, and local library resources (Moore & Kearsley, 2012). As can be seen, all technologies used in the project were used during the period in which it was implemented.

The idea of an Open University in Great Britain was originally conceived only for television and radio broadcasts to provide open access to higher education for the adult population. However, in November 1967, upon the planning committee's review of the University of Wisconsin's achievements and methods in the AIM project, he invited Wedemeyer, the director of the AIM project, to London. In the next 2 years, the Open University began to take shape. Wedemeyer later stated that "Almost all of the geography of open education systems was determined in the AIM project experiments" (Wedemeyer, 1982, p.24).

Teleconference Systems

The first teleconferencing technology was used as audio conferencing in the 1970s and 1980s. Contrary to the previous phases, there was direct two-way communication where students could ask questions and get answers from their teacher. Students and teachers can interact in real-time in different places.

The first video conferencing systems became widely used in the 1990s. Two-way video conferencing systems initially transmitted video signals from one studio to another. It can be said that it is quite expensive these days. Video signals are compressed with a device called a codec, which was the size of a refrigerator in the early days, and sent to the opposite studio. Later, these devices came to a size that could fit inside a personal computer. Two-way video conferencing systems have become more

affordable and faster thanks to fiber optic cables used in telephone lines (Moore & Kearsley, 2012).

Internet and Web Technology

With the Internet and web technologies, distance education has accelerated. While only 50 pages were hosted on the Web in 1992, the number of pages increased to over 1 billion in 2000 (Maddux, 2001). In the 1990s, many universities started Web-based programs. In all previous stages, distance education practices specific to that period were carried out in the distance education process, and new thoughts and ideas about how distance education would have emerged with the spread of the internet and web technologies (Moore & Kearsley, 2012). Some of these are learning management systems, video, animation, simulation content, virtual classrooms, etc. applications (Tuncer & Taşpınar, 2008). In addition, the widespread use of mobile internet access provides a prediction that mobile-based learning (m-learning) will gain importance in the future (Özbay, 2015).

Tools Used in Distance Education

Considering all the historical development stages of distance education, it is seen that the most effective communication technology of that period was used. The tools used in distance education are printed tools (books, worksheets, faxes, etc.), audio tools (radio, audio conference, sound recordings, etc.), video tools (television, videotapes, satellite broadcasts, DVD, etc.), and computers (e-mail, web-based resources, smartphones, etc.) are divided into 4 categories (Barron, 2009). These categories and their advantages-disadvantages made by Barron (2009) are given in Table 1.

Tablo 1. *Tools Used in Distance Education and Their Features (Barron, 2009)*

CATEGORY	TOOLS	ADVANTAGES	DISADVANTAGES
Printed	Textbooks Study guides Workbooks Fax	Being very portable Ease of Use Cost-Effective	No interaction Requires reading skills Long delivery time to the student
Audio	Radio Telephone Audio Mail Audio teleconferences Audio files / CDs	Cost-effective Being Easily Accessible Ease of Use	Not suitable for visual information Requires planning for simultaneous voice communication Lack of visual only audio interaction
Video	TV Video Cassettes Satellite Broadcasts DVD	Allows both audio and video communication Having both audio and visual communication High level of interaction	To be costly Requires a lot of planning and preparation Requires technical support team
Computer	Email, chat, etc. Web-based resources Video conferences Smartphones	Ability to learn at your own pace It can contain text, graphics, audio, and video. High level of interaction cost-effective Worldwide reach	Requires hardware and software Requires great planning computer viruses Problems from computer systems or network

Purpose of the research

In this study, after examining the development of distance education from the past to the present according to the literature, it is aimed to examine the views of the instructors involved in the distance education process about the problems experienced in distance education today and what could happen in the field of distance education in the future. As a result of the opinions received, it is aimed to classify the problems experienced today and to reveal what is expected from distance education applications in the future.

Importance of research

The findings at the end of the study will guide the features needed in solving the problems in today's applications and the development of new technologies and software for the future. Determining the problems in today's applications is very important in terms of solving these problems. Considering the outputs of the study, it is one of the most important outputs of the study to add the features needed in the future to the existing applications or to guide the development of a new application in the distance education applications that are expected to be used more widely in the future.

METHOD

Model of the research

This study is aimed to take the opinions of the instructors who have taught at least one semester through distance education on the current distance education systems and examine their predictions about how distance education can be in the future. For this reason, the phenomenology method, one of the qualitative research methods, was used in the research. Phenomenology focuses on phenomena that we are aware of but do not have a deep understanding of, according to Cropley (2002). Another definition is a research method that allows the researcher to examine the experiences of a case or event in depth (Yıldırım & Şimşek, 2018). Best and Kahn (2017) define phenomenology studies as an approach that explains the current situation or examines and analyzes the structure between the factors affecting change and development

Study group of the research

The study group of this research consists of 11 instructors who have taught at least one semester through distance education at a university. While choosing the study group, homogeneous sampling, one of the purposive sampling methods, was used. Purposeful sampling is a non-random sampling approach and allows in-depth research by selecting information-rich situations or groups depending on the purpose of the study (Patton, 2014). The homogeneous sampling method is the selection of a homogeneous subgroup related to the purpose of the research from the research population (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2013).

Research Instruments and Processes

In this study, semi-structured interview forms were used as a data collection tool. The interview form was prepared by reviewing the literature and taking expert opinions. The data collection process was recorded in the form of remote interviews due to the Covid-19 Pandemic and the measures taken in this context. The questions in the semi-structured interview form, which is the data collection tool, can be seen below.

Interview Questions

Concerning the Current Situation

- Which distance education applications (moodle, alms learning management system, google meet, teams, zoom, adobe connect, etc.) have you used so far?

- Do you find the distance education applications you have used so far useful?

- If yes, in what ways do you think it is useful?

- If you don't find it, why don't you find it useful? What features would you like to have?

- What are the problems you have encountered in the distance education applications you have used so far?

Opinion Questions about the Future Situation

- What kind of developments can occur in the future, taking into account distance education and practices from the past to the present?

- Considering the distance education applications you currently use, do you think these applications will become widespread in educational environments after the epidemic? o Why?

- What kind of developments do you foresee in face-to-face education and distance education practices in educational environments in the future?

Data Analysis

The content analysis method was used in the analysis of the data. The content analysis method is a qualitative analysis method that aims to identify and reveal important information on the collected data (Marshall & Rossman, 2014). Interviews were held in the form of interviews by connecting with the participants via remote video conferencing tools. These interviews were recorded and analyzed. According to Altunışık (2010), the following steps should be done during the data analysis process:

- Creating a framework for descriptive analysis,

- Processing data according to the thematic framework,

- Description of findings,

- Interpretation of the findings

While examining the records, first of all, important concepts in the records were determined. Then, coding was done according to the purpose of the research, a logical structure was developed and themes were created. These themes were analyzed numerically and interpretations were made.

Reliability of the Research

To ensure reliability in the research, researcher triangulation and data sources triangulation methods were used. Investigative triangulation involves more than one investigator in data collection, analysis and interpretation; Triangulation of data sources is defined as the use of a wide variety of data sources (Denzin, 1978). In this study, the opinions of the lecturers working in different faculties were taken. At the same time, the interviews were made, analyzed, and interpreted by the researchers involved in the study.

While the themes were being extracted, the audio recording recorded as a result of the interviews was first translated into text. Afterward, the researchers formed separate themes with the interviews that were translated into text. The final version of the themes was determined by discussing the items created by the researchers. In addition, the opinions of the participants on the prominent items in the findings section are given as one-to-one quotations.

Ethic

Name of the committee that made the ethical evaluation: Bolu Abant Izzet Baysal University, Human Research Ethics Committee in Social Sciences

Date of ethical review decision: 29.04.2021 - Ethics assessment document issue number: 2021/187.

FINDINGS

According to the examinations made as a result of the interviews, opinions have been reached under various headings regarding distance education today. These; applications, advantages, useful aspects, views on the future of distance education, requirements, hybrid education model, post-pandemic process, problems, and reasons for preference.

Many computer applications are used in distance education processes. In line with the findings, it was seen that all of the instructors participating in the research used at least one distance education application. Information on the applications used in distance education is shown in Table 2.

Table 2. *Communication systems and platforms used in distance education*

Communication systems or platforms used in distance education	Frequency	Percent (%)
Google Meet	11	100
Microsoft Teams	11	100
Zoom	9	81,8
Edmodo	1	9,1
Adobe Connect	1	9,1
Blackboard	1	9,1
Skype	1	9,1
Perculus	1	9,1

In Table 2, the most used application in the research sample is listed as the least used application. Among the applications currently in use, Google Meet, Microsoft Teams, and Zoom applications emerged as the most widely used applications by the participants.

One of the topics that emerged as a result of the research is the advantages of distance education. As a result of the research interviews, the views on the advantages of distance education are listed in Table 3 below.

Table 3. *Advantages of Distance Education*

Item No	Advantages of Distance Education	Frequency	Percent (%)
1	Enabling students to repeat through recordings	3	27,3
2	To give homework	2	18,2
3	Easy sharing of recordings	2	18,2
4	Creating different groups in the lesson	1	9,1
5	Mutual communication	1	9,1
6	Whiteboard sharing	1	9,1
7	Stronger interaction thanks to video and voice communication	1	9,1
8	Sharing different resources more easily in distance education	1	9,1
9	Submitting an attendance report	1	9,1
10	Mobile app support	1	9,1
11	Web application support	1	9,1
12	Technical support provided by the developer company	1	9,1
13	The interfaces are suitable for individuals with low technology literacy	1	9,1

As seen in Table 3, enrollment in the courses and allowing students to repeat the courses are one of the most important advantages of distance education. Some of the participants' views on this situation are as follows:

"It has the following advantage for students; maybe they can open the lecture that the teacher tells and listen and watch and get more efficiency from it" (Table 3, Item 1) K10

"It is nice that different groups can be formed in the course. You can do other homework. You can make narrations, screen sharing, etc. These are nice features" (Table 3, Item 2, 4, 6) K2

"One of the aspects that I find useful is that it allows mutual communication, so you can see your students, so your presentations are more active and there is no problem in terms of transmitting data anymore" (Table 3, Item 5) K5

Another topic in the opinions of the participants was the beneficial aspects of distance education. Information about the results of the interviews is shared in Table 4.

Table 4. *Useful Aspects of Distance Education*

Item No	Useful Aspects of Distance Education	Frequency	Percent (%)
1	Finding applications useful	7	63,6
2	Facilitates participation in seminars and congresses	3	27,3
3	Useful in Pandemic Conditions	2	18,2
4	Useful for specific (theoretical) courses	2	18,2
5	Providing time and place of independence	2	18,2
6	More useful for postgraduate courses	2	18,2
7	Useful for personal professional development training	1	9,1
8	More useful in crowded classrooms	1	9,1
9	Providing equal opportunity in education	1	9,1
10	Facilitating graduate education evaluation meetings	1	9,1

When Table 4 is examined, it is concluded that the participants find distance education useful in general, but more useful in some conditions. As a result of the interviews, expressions such as remote participation in seminars and congresses, finding it useful only in pandemic situations, finding it useful for certain courses, and providing time and place independence come to the fore. Some participants views on the benefits of distance education are as follows:

"Accessing information has been very easy. Yes, for example, I just told you that I attended a training, if I wanted to attend this training, training is organized almost every week. It is organized by an association and I can follow it very well every week." (Table 4, Item 1, 2, 7) K7

"I find distance education applications useful like this, of course, don't they have disadvantages as well? Of course, there is, but of course, I think it is very useful and useful during the pandemic process right now. Because now we have to continue the education. Of course, it is useful, if necessary." (Table 4, Item 3) K10

"I think it offers students an equal opportunity to learn. I think that it accelerates the followability of the courses and provides resources to the students after the course. I also find it useful in terms of providing equal opportunities. In other words, I think that if a person in the village has a computer or internet, they can access any openly given courses and they will benefit in this way." (Table 4, Item 1,5,9) K3

"Here, at least, you have the opportunity to meet whenever you want, whenever you want. I find it very useful, especially for graduate students. Because the number of our graduate students is known. Whatever 3 people are 4 people, there is a certain number of them. By opening the screen directly with each student and sharing it, there is an opportunity to talk as if it were a face-to-face education." (Table 4, Item 6) K4

"Although we don't use a lot of amps in the classroom environment. I only use an amp from 1 lesson. For example, it was a problem to write there. He had vision problems. … there are 200 or 300 people in big lecture halls, so it is more efficient to conduct lessons remotely than to attend lectures in that lecture hall. Crowded classrooms should be considered especially for lessons held in large lecture halls." (Table 4, Item 8) K8

"It saves time in our daily life, saves on the road. It's just 1 click away. In other words, it is enough to have internet in 1 place. It is very useful actually." (Table 4, Item 5) K6

Table 5. *Views on the Future of Distance Education*

Item No	Views on the Future of Distance Education	Frequency	Percent (%)
1	Increasing virtual reality augmented reality applications	9	81,8
2	The hologram structure will be used	8	72,7
3	Distance learning becoming more popular with the pandemic	3	27,3
4	Distance education applications are customized according to the departments	2	18,2
5	Personalized learning tools	1	9,1
6	Using apparatuses that transfer touch and contact (Health, Physiotherapy, etc.)	1	9,1
7	Environments with more interaction	1	9,1
8	Applications with a robotic approach	1	9,1

Regarding the future situation of distance education, most of the participants think that virtual reality and augmented reality applications will increase (81.8%) and tools such as holograms will increase (72.7%). In addition, the views that distance education will be more popular after the pandemic process can be customized to departments, include more sensory organs, increase interaction, and robot teacher systems have emerged. Some opinions on these topics are as follows:

"I think even a classroom environment can be created with virtual images. Maybe we will be able to see the camera taken by the student with a projection in the classroom environment. We will teach as if we are normal students, a bit like a hologram." (Table 5, Item 1, 2) K2

"Especially meetings that are held informally, if not directly for educational environments, I don't know, online seminars, you know, now that seminars are held, not everyone can come from everywhere. I think it will become widespread, especially in such titles." (Table 5, Item 3) K1

"There are also apparatuses that transfer touch and contact in departments such as physiotherapy in the field of health. So maybe these kinds of things seem to be used in our profession, for example. I think it will be more interactive. So this hologram, that virtual reality just seems like the beginning of that job." (Table 5, Item 4, 6) K10

"I also think that one of the things that should be done is that when you put on the virtual reality glasses, the sense organs should be affected a lot in the environment in 3D. In other words, I think it has to be for you to feel yourself in the job." (Table 5, Item 1, 7) K5

"I think that by analyzing learning features with artificial intelligence, more personal learning environments will be created with learning analytics" (Table 5, Item 5, 8) K3

Table 6. *Requirements for Distance Education*

Item No	Requirements for Distance Education	Frequency	Percent (%)
1	Giving orientation to teachers about distance education	5	45,5
2	Student's willingness to take distance lessons	3	27,3
3	The necessity of regulation and procedural principles regarding distance education	3	27,3
4	Creation of technical classes in each faculty	2	18,2
5	Investigation of new measurement and evaluation methods in distance education	2	18,2

6	Students have high technology literacy	1	9,1
7	Providing internet support to students	1	9,1
8	Providing technical support	1	9,1
9	Students are required to attend the class live	1	9,1
10	Ensuring interaction in distance education courses	1	9,1

The prominent opinions on the theme of what should be in distance education emerged as the necessity of giving orientation to teachers about distance education and those students be willing to take distance lessons. Other opinions appear as requirements such as having procedures and principles regarding distance education, having a technical class in faculties, researching new measurement and evaluation methods, providing internet support to students, and providing technical support and interaction in distance education processes. Some participant opinions on these topics are shared below.

"I am sure there are people who have difficulties in terms of technology, I think it can be good in terms of orientation training in this process." (Table 6, Item 1) K10

"I think it is necessary to take 1 training at first. Until you learn until you do something in the system… Orientation is absolutely necessary, and when I think about it in terms of teachers" (Table 6, Item 1) K11

"In certain classes in faculties, such a technical class can be created, for example, the teacher sits on the blackboard again. Students are projected onto a large screen on the classroom side, but I think that something can be done mutually in that way, the students see the board and the teacher from the camera again" (Table 6, Item 4) K4

"Distance education is useful, but I think that the student should have some awareness and his enthusiasm for education. Because students who don't are also going in the opposite direction." (Table 6, Item 2, 9) K9

"You know, we need to try different measurement and evaluation methods from a distance, rather than face-to-face exams… that is, we need to go to new measurement systems" (Table 6, Item 5) K5

"Distance education directive teaches how the lesson will be done, of course, how it will work, the teacher knows, the instructor knows, there is no problem with it, but I think that 1 directive and 1 procedural basis should be at least for every university, how long it will take and what can be done in this process." (Table 6, Item 3) K2

"Technical support is important, that is, it is nice to introduce the program at least, and to show all those features within the applications itself" (Table 6, Item 1, 8) K4

Table 7. *Problems in Distance Education*

Item No	Problems in Distance Education	Frequency	Percent (%)
1	Internet outage and technical issues	8	72.7
2	Low student participation	6	54.5
3	Less teacher-student interaction	6	54.5
4	Insufficient measurement and evaluation	4	36.4
5	Lack of technical knowledge	4	36.4
6	Problems caused by the teacher's computer (lack of hardware, heavy applications)	2	18.2

7	Students do not react in the virtual classroom environment	2	18.2
8	Insufficient infrastructure services	2	18.2
9	Camera and Microphone settings issues	2	18.2
10	Problem with accessing course records	1	9.1
11	Teachers' use of methods in traditional education environments from distance education environments	1	9.1
12	Low level of readiness in distance education applications	1	9.1
13	Low student concentration	1	9.1

When Table 7 is examined, it is seen that internet interruptions and technical problems are the main problems experienced in distance education. In addition to the technical problems, as a result of the interviews, problems such as low participation of the students in the courses, insufficient interaction, low student concentration, lack of technical knowledge of the participants in the distance education process, low level of readiness, insufficient infrastructure services, and the problem of accessing the course records emerged. Some of the participants' opinions are as follows.

"Not all students turn on camera microphones. It is not clear what they are doing against it, especially in terms of licensing. In other words, we are faced with the following things, the lesson is over, for example, 10 people stay there, it is obvious that they do not listen, they do not even close, so we have a big problem in this regard. It doesn't look like a two-person relationship, it doesn't feel like a lesson. These transactions are very lacking in interaction." (Table 7- Items 2, 3, 7, 13) K11

"I had problems due to the infrastructure when I was teaching, that is, due to insufficient servers, if there was too much load at the same time, there were breaks in our lessons during the lesson" (Table 7- Item 1, 8) K3

"When we look at the average age of the existing users, we see that many teachers are over 35 years old and 1 generation who had to switch technology quickly in 2 or 3 generations. Therefore, there are problems in their use of distance education applications." (Table 7 - Item 5) K6

"We do not have a chance to follow a student one-to-one in distance education environments. Who understood what you are talking about? Who Doesn't Understand or is following? I don't even understand it. So interaction is low. We do not receive feedback. There is no answer" (Table 7- Item 3, 4, 13) K9

"I think that teachers who have always been accustomed to traditional education find it difficult to adapt to the new system." (Table 7- Item 11) K3

"The most important deficiency was the low level of readiness of the teachers and students, who were the stakeholders of this course process, so the teachers did not know how to use it" (Table 7- Item 12) K1

"Sometimes there may be connection problems, that is, it may be due to the internet. Now I have a process like this, especially when we worked remotely, especially when we were working remotely, I was having problems sharing due to my own personal home connection problems. Likewise for students. Some of our students were having trouble connecting to the connected internet system at work." (Table 7- Items 1, 6, 9) K2

DISCUSSION, CONCLUSION, RECOMMENDATIONS

When the applications used in distance education are examined, it has been revealed that the most frequent applications are Google Meet, Microsoft Teams, and Zoom. While there are many alternative applications, the reasons for these applications to come to the fore may be factors such as their strong infrastructure, enabling mutual communication, easy integration, keeping them constantly updated, ease of use, security, and adding new features in the process according to needs. Such factors should be considered if a distance education application is planned to be developed or evaluated.

In the research, remarkable findings have emerged within the scope of the advantages and benefits of distance education. It can be stated that these results are the tasks that an instructor does in the lessons conducted in a face-to-face classroom environment, but which are more difficult to do (assigning homework, collecting homework, and evaluating and feedback). For example, making assignments and collecting them from students can create more workload in face-to-face classroom environments than in distance education systems. In addition, it was found that most of the lecturers with whom the interviews were made agreed that the most important advantage was the replayability of the recordings for the benefit of the students. When this situation was examined in terms of student opinions, similar results were found (Özdoğan & Berkant, 2020). The factor that allows the lessons to be watched again is the recording of the lesson. The most important reason why this situation is an advantage in distance education may be the lack of technical equipment and cost in face-to-face education environments. Because in the distance education process, many instructors have already been able to take records through the technologies (webcam, etc.) available on their devices. At the same time, it will be much more costly to install devices such as webcams and microphones, whose prices increase in line with the increasing needs, in face-to-face classroom environments.

When the advantages and benefits of distance education are examined, it is seen that there are findings such as creating time for the academic staff to devote to their professional and personal development and providing time and space independence. The reason for this may be that the necessity of being in the classroom environment in the face-to-face education process and the transportation difficulties for participation in seminars and congresses can be overcome with distance education opportunities.

In addition, some of the views are that distance education is only useful for not disrupting education during the pandemic process, it is more useful in certain (theoretical) courses, but not suitable for some courses, it is more useful in graduate courses and graduate evaluation meetings (thesis monitoring, thesis defense, etc.). These views may be due to the problems experienced by the instructors.

The statements in the title of problems experienced in distance education, which is one of the findings of this research, show that the problems experienced are mostly due to technical problems and the lack of knowledge, skills, and experience of teachers and students. This situation can be associated with the low level of readiness of the instructors and students due to the rapid transition to distance education due to the pandemic. Koloğlu, Kantar, and Doğan (2016) emphasized that the level of readiness of all stakeholders (student, trainer, etc.) is important to be successful in distance education. Sherry (1995) stated that changing stakeholder roles in distance education is one of the problems in distance education. The inability of instructors and students to adapt to their changing roles in distance education may affect their readiness levels. Among the findings of this research, fulfilling the requirements such as giving orientation to instructors within the scope of the requirements in distance education, high technology literacy levels of the students, the willingness of the students to distance education, and the provision of support such as the internet and technical support will increase the readiness levels of teachers and students. Therefore, it will contribute to the reduction of negative opinions about distance education and be more efficient.

One of the findings obtained from the lecturers in the research is their thoughts about the future of distance education. When the expressions within this scope are examined, it is seen that it is thought that technologies (virtual reality, hologram, etc.) that we see examples of today, but not yet widespread, will become widespread in the future. At the same time, the participants think that distance education has become popular with the pandemic and will become more popular over time. It is seen that the problems experienced in distance education are the lack of interaction (unresponsiveness of students in live lessons, etc.) and the deficiencies in applied lessons (inadequacy of current conference technologies in applied lessons, lack of distance education materials for applied lessons, etc.) will be solved with different applications in the future. These views can be considered as the expectations of the instructors participating in the research to eliminate the deficiencies they have experienced during the distance education process. It is recommended that these views be taken into account in future research and practices related to distance education. These views of the instructors may be an indication that they have a positive attitude about the future of distance education.

As a result, distance education, which has transformed into different forms with the developing technologies from the past to the present, is gaining importance due to meeting the increasing educational needs of today and lifelong learning becoming a necessity in the 21st century (Fırat, 2016). In this research, as a result of the interviews about distance education were examined in 4 categories: advantages and useful aspect, requirements, problems, and views for the future. Particularly prominent items in these categories can be listed as follows; "enabling students to repeat through recordings, finding applications useful, facilitates participation in seminars and congresses", (advantages and useful aspect), "giving orientation to teachers about distance education, student's willingness to take distance lessons, the necessity of regulation and procedural principles regarding distance education, creation of technical classes in each faculty and investigation of new measurement and evaluation methods in distance education" (requirements), "internet outage and technical issues, low student participation, less teacher-student interaction, insufficient measurement and evaluation, lack of technical knowledge" (problems), "increasing virtual reality augmented reality applications, the hologram structure will be used " (opinions for the future) can be listed as prominent items. When these prominent results are considered, for learning management system developers; problems experienced in the system, and features that should be added, for researchers; It can be said that it is a guide for future experimental studies. It is recommended to carry out studies on supporting the advantages and beneficial aspects, realizing the features that are seen as a necessity, providing solutions for the problems, and meeting the expectations for the future in future research.

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The Relationship Between School Satisfaction and Psychological Well-Being of Secondary School Students: The Mediating Role of Happiness at School

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Article Info	ABSTRACT
	This study aimed to examine the mediating role of happiness at school in the relationship between secondary school students' school satisfaction and psychological well-being. A total of 367 secondary school students, including 204 girls (55.6%) and 163 boys (44.4%), participated in the study. While collecting the data for the study, Personal Information Form, Overall School Satisfaction Scale for Children, Stirling Children's Well-Being Scale, and School Children's Happiness Inventory were used. First, descriptive statistics of the collected data were calculated and the relationships between the variables were determined by the correlation coefficient. Mediation analysis in the research was made using structural equation modeling. As a result of the analysis, it was seen that the school satisfaction of secondary school students positively predicted both their psychological well-being and their happiness at school. Similarly, secondary school students' happiness at school positively predicted their psychological well-being. In addition, as a result of the structural equation analysis, it was seen that happiness at school has a partial mediator role in the relationship between school satisfaction and the psychological well-being of secondary school students. Bootstrap confidence intervals (%95) were calculated to see if the mediation effect was significant, and it was determined that the results did not include zero and therefore the mediation result was significant. This result can be interpreted as secondary school students' school satisfaction increases their happiness levels at school, and their psychological well-being increases with the increase in their happiness at school. All these results reached in the research draw attention to how important school-based experiences are for the mental health of school-age children.

INTRODUCTION

School-age children spend most of their time in school. This period covers almost two-thirds of children's lives (OCED, 2020). Although schools are considered institutions that are expected to support the healthy development of children in personal-social, educational, and professional areas, the success of students does not increase in parallel with the time spent in schools (Gökçe, 2012). This situation makes it necessary to discuss different concepts related to school psychology (Baker, Dilly, Aupperlee, & Patil, 2003). In addition to the quality of the educational practices offered, children's level of adaptation to school, their happiness at school, their school satisfaction, and their positive attitude towards school also affect students' school success (Tian & Liu, 2007). Many factors such as teacher-student relations, friendship relations, whether they have positive feelings towards school, and the satisfaction they get from school life affect children's positive attitudes towards school (Baker, 1998; King, Huebner, Suldo, & Valois, 2006). For this reason, it is seen that it is necessary to conduct various research on many concepts related to school psychology that are effective on children's mental health.

School Satisfaction

School satisfaction is one of the most important factors affecting students' educational life. School satisfaction is explained as the cognitive evaluations that students make about the quality of their school life (Huebner, 1994). In other words, school satisfaction is also defined as the level of satisfaction with school life, liking these experiences, and feeling good during the time spent at school (Tian et al, 2014). As it can be understood from the definitions, it is seen that school satisfaction is a factor that can impact the academic and mental health of school-age children. Although school satisfaction is considered to be an important factor affecting the mental health of school-age children (Kalaycı & Özdemir, 2013), when studies on school psychology are examined, it is seen that there is not much research on children's school satisfaction (Jovanović & Jerković, 2011). It is striking that the studies and regulations aimed at increasing the quality of education are mostly academic, and the issues related to children's mental health development are neglected (Randolph et al., 2010). In the studies in the literature and the educational arrangements, it is stated that although the studies on the school satisfaction of the students are insufficient, the school satisfaction of the students is an important factor affecting their subjective well-being and general life satisfaction (Casas et al., 2013; Diener et al., 1999). Because school satisfaction is an important component of school-age children's life satisfaction (Verkuyten & Thijs, 2002). The results of the studies in the literature support this theoretical information on the subject. For example, in some studies, it has been observed that children with high school satisfaction have high academic achievement (Verkuyten & Thijs, 2002) and less absenteeism from school (King et al., 2006). Similarly, other studies have found that students with high school satisfaction have high self-esteem (Tian et al., 2013), life satisfaction (Gilman & Huebner, 2006), and psychological well-being (Kalaycı & Özdemir, 2013), and have less frequency of undesirable behaviors in school (Önder & Yılmaz, 2012; Zullig, et al., 2011). On the other hand, it is stated that school satisfaction has an effect on students' adaptation to school, developing commitment to school, and making maximum use of the education offered (Whitley et al., 2012). Likewise, it is stated that students with high school satisfaction levels establish healthier and stronger relationships with their peers and teachers, and are more willing to participate in school-related activities (Fredricks et al., 2003). In addition, it is said that school satisfaction is also effective on students' happiness levels regarding their school life (Huebner et al., 2009). When the above theoretical explanations and research results are examined, it is seen that school satisfaction is a factor that is highly effective on the mental health of school-age children. For this reason, it is noteworthy that knowing the school satisfaction levels of children is an important factor for determining their satisfaction level for their school-based learning experiences, and for developing and arranging educational environments.

Happiness at School

The concept of happiness has started to be more and more the subject of research with the emergence of the positive psychology current (Seligman, 2011). This concept is conceptualized as subjective well-being in the positive psychology approach (Diener et al., 2009). Subjective well-being is defined as the individual's experience of more positive emotions and less negative emotions in daily life, and being satisfied with his/her life (Deiner et al., 2009). In other words, subjective well-being is a concept consisting of cognitive and affective judgments of the individual about her/his own life (Diener, 2000). Subjective well-being consists of the affective component, which includes all the emotions that the individual has experienced, and the life satisfaction component, which includes the cognitive evaluations of the life in which the individual lives (Diener et al., 2009). Considering the definitions and explanations above, it is seen that the emotional and cognitive quality perceptions of individuals' daily lives are effective on their subjective well-being. The fact that school-age children spend a lot of time in schools and what they think and feel about school-based experiences during this period brings to mind the concept of happiness at school. Happiness at school is defined as the positive feelings of students about school as a result of the consistency between students' expectations from the school, their personal needs, and the opportunities offered by the school and its environment (Engels et al., 2004; Tian, 2008). In other words, happiness at school is expressed as a situation where positive emotions of the student about school climate, teacher-student relations, peer relations, and other in-school activities are patched more frequently and negative emotions are patched less (Løhre et al., 2010; Uusitalo- Malmivaara, 2011). As it can be understood from the definitions, it is seen that the satisfaction with their school-based life will also be effective on the subjective well-being of school-age children. It is stated that it is important to organize these environments as places that offer meaningful experiences for children and where positive and positive emotions are experienced since schools are institutions that make significant contributions to children's subjective well-being (Tekinalp & Terzi, 2015). Likewise, Seligman et al. (2009) stated that it is necessary to support school-based subjective well-being levels to increase students' academic achievement and to actively participate in their learning lives. It is even stated that the happiness achieved at school facilitates children's participation in school activities and contributes to the development of positive feelings about their future education life (Stiglbauer et al., 2013). Considering all these explanations, it is seen that happiness related to school-based experiences is an important research topic in terms of the mental health development of school-age children and more research is needed on this subject.

Psychological Well-Being

Psychological well-being is an important concept for the mental health of school-age children. Psychological well-being emerged with the criticism that the concept of subjective well-being put forward by Diener (1984) is a hedonic approach. In the future, some researchers working in the field of positive psychology did not try to define the concept of psychological well-being. It has been said that subjective well-being is insufficient in explaining mental well-being because it mostly focuses on factors such as people experiencing more positive and less negative emotions. For this reason, some researchers working in the field of positive psychology have tried to define the concept of psychological well-being. For example, Seligman (2011) stated that happiness can be a "thing", but well-being is a "construct" and things related to happiness (positive emotions) can be a part of this structure. For this reason, Seligman (2011) re-examined the concept of well-being and revealed a structure consisting of positive emotions, success, meaning, positive relationships, and engagement sub-dimensions. Similarly, Ryff (1989) redesigned the concept of well-being, said that this concept could not be explained only by individuals' happiness or not, and defined the concept of psychological well-being on which psychological functionality was based. Ryff (1989) designed well-being as a structure consisting of six dimensions: self-acceptance, positive social relations, being autonomous, being able to control one's environment, the meaning of life, and motivation for self-development. When we look at the above theoretical explanations

about psychological well-being, it is noteworthy that many components in the lives of individuals are effective on this concept and that it is an indicator of one's mental health.

When the literature is examined, there are various studies on the psychological well-being of children. In these studies, it has been seen that there is a positive correlation between the psychological well-being of children and self-acceptance (Godin, 2011), social adaptation (Kitayama et al., 2010), mental health (Ellison & Fan, 2008), and perceived positive parental attitudes (Raja, McGee, Stanton, 1992). In other studies, it has been concluded that there is a negative relationship between children's psychological well-being and stressful life events (McMahon et al., 2020), bullying experiences (Liu et al., 2020), social anxiety (Kermen et al., 2016), negative self-concepts (Özdemir, 2016) and family conflicts (Sweeting & West, 1995). In addition to the factors mentioned above, school-based experiences can have an impact on the psychological well-being of school-age children. Schools cover a significant part of children's lives and the experiences they spend at school (peer and teacher relations, happiness at school, success, attitudes towards school) are critical for the mental health of school-age children (Paternite, 2005). Because during the time spent at school, children can experience many experiences that can affect them positively or negatively (Huebner & Gilman, 2006). Seligman et al. (2009) emphasize that school-based experiences are a very important factor in terms of the psychological well-being of school-age children. It is known that children's experiences at school, peer relations and experiences, and evaluations of these experiences are effective on students' well-being (Huebner & Gilman, 2006). However, there are very few studies in the literature on this subject. Studies have shown that factors such as a supportive school climate (Suldo et al., 2013), positive teacher attitudes (Seligman et al., 2009), school kindness (Kaya-Memiş & Oğuz-Duran, 2019) contribute positively to students' psychological well-being. When the theoretical explanations of psychological well-being are evaluated together with the limited research results in the literature, it is seen that school-based experiences (school satisfaction, happiness at school, school engagement, etc.) may have critical importance for the psychological well-being of school-age children. And this indicates that you need more research on this subject.

The Present Study

It is stated that the current age, school-related burnout of children is increasing gradually (Aypay, Durmuş, & Aybek, 2016). The Good Childhood Report (2021), in its latest report, announced that since 2010, when this survey study started, the happiness levels of children at school have been gradually decreasing. In the same report, it was also stated that the decrease in the level of happiness related to school-based experiences hurt the psychological well-being of children (The Good Childhood Report, 2021). On the other hand, OECD (2020) stated in its latest education report (Education at a Glance) that although children spend too much time in schools, schools have problems in reaching their desired educational goals. The results of these published reports bring to mind the concepts of school satisfaction and happiness at school, which are effective on children's school life and also on their psychological well-being. Because many researchers emphasize that school-based experiences are important for the mental health of school-age children (Huebner, 1994; Huebner & Gilman, 2006; Seligman et al., 2009; Tian, 2008; Tekinalp & Terzi, 2015). It is even considered that students' satisfaction with school-based experiences may have significant effects on their general well-being (Casas et al., 2013; Kalaycı & Özdemir, 2013). However, it is stated in the literature that there are very few studies on students' affective areas such as school satisfaction, school happiness, and psychological well-being levels, and there is a need for new research on this subject (Jovanović & Jerković, 2011; López-Pérez & Fernández-Castilla, 2018; Randolph et al., 2010). Based on all these explanations, this study, it is aimed to examine whether happiness at school has a mediating role in the relationship between secondary school students' school satisfaction and their psychological well-being. For this purpose, the following hypotheses were examined:
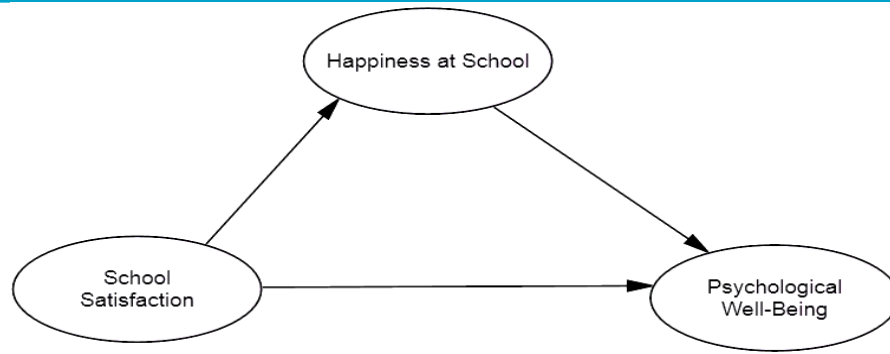
Figure 1. *Research model*

H₁: School satisfaction will predict psychological well-being positively.

H₂: School satisfaction will positively predict happiness at school.

H₃: Happiness at school will positively predict psychological well-being.

H₄: Happiness at school will have a mediating role between school satisfaction and psychological well-being.

METHOD

Participants

The study group of the research consists of a total of 367 secondary school students, of whom 204 (55.6%) are girls and 163 (44.4%) are boys. The ages of the students vary between 10-14 (x= 12.53; Sd=1.53). Of the participants, 88 (24%) were in the 5th grade, 91 were in the 6th grade (24.8%), 88 were in the 7th grade (24%), and 100 were in the 8th grade (27.2%).

Data Collection and Ethical Process

First, the ethics committee permission was obtained from the "Ondokuz Mayıs University Social and Humanities Sciences Ethics Committee (05.02.2020 Date and Decision no: 2020/53)". After the approval of the ethics committee, the school administrators who planned to conduct the study were informed and necessary permissions were obtained. Then, the children and their parents were informed about the research by the school psychological counselor at the institutions where the study was planned, and the process was carried out by taking into account the voluntary basis. After all these stages, the institutions to be studied were visited and the measurement tools were applied face-to-face to the students in the classroom environment. Data collection tools were applied to 387 students in total, but the measurement tools of 20 students who were found to have filled in the measurement tools incorrectly or incompletely were removed from the data set, and the study was continued with 367 students.

Data Collection Tools

Personal Information Form

It is a data collection tool created to collect students' gender, age, and grade level information.

Overall School Satisfaction Scale for Children (OSSS-C)

The scale, which was developed by Randolph, Kangas, and Ruokamo (2009) to evaluate the school satisfaction of primary school students, was adapted into Turkish by Telef (2014). The scale consists of six items and one dimension. Participants answered the measurement tool using the five-point Likert type (1-totally disagree, 5-totally agree). The scores that can be obtained from the OSS-C range from 5 to 30. The internal consistency coefficient (Cronbach Alpha) of the OSS-C calculated in this study was .87.

Stirling Children's Well-Being Scale (SCWBS)

Developed by Liddle and Carter (2015) to measure the psychological well-being of children aged 9-16, the measurement tool consisting of 12 items and one dimension was adapted into Turkish by Akın, Yılmaz, Özen Raba, and Özhan (2016). Participants answered the measurement tool using the five-point Likert type (1-never, 5-always). The scores that can be obtained from the SCWBS range from 5 to 60. High scores obtained from the scale indicate that children have high psychological well-being. The internal consistency coefficient (Cronbach Alpha) of the OSS-C calculated in this study was .88.

School Children's Happiness Inventory (SCHI)

It was developed by Ivens (2007) to evaluate the emotions and thoughts experienced by children between the ages of 8-15 during their time at school. The SCHI was adapted to Turkish by Telef (2014a). The measurement tool consists of a total of 30 items, fifteen positive (positive subjective well-being) and fifteen negatives (negative subjective well-being) items in a four-Likert type (1-I never agree, 4-I totally agree). Negative items are scored in reverse. The scores that can be obtained from the SCHI range from 30 to 120. The internal consistency coefficients (Cronbach Alpha) of The SCHI calculated in this study were .91 for all, .88 for positive subjective well-being (positive items), and .87 for negative subjective well-being (negative items).

Analysis of Data

Standard deviation, mean, kurtosis, and skewness values were calculated to analyze the descriptive statistics of the data collected from the study. In addition, correlation (r) analysis was used to examine the relationship between school satisfaction, happiness at school, and psychological well-being variables. In this study, the parcellation method was used for the variables of happiness in the school with a large number of items and psychological well-being, which is one-dimensional. The parcellation method is a recommended method to reduce the errors of one-dimensional measurement and measurement tools with a large number of items and to increase the validity and reliability of the measurements (Little et al., 2002; Nasser-Abu Alhija & Wisenbaker, 2006). In addition, it is stated that the use of the parcellation method in the measurement of characteristics such as attitude or personality evaluated by the self-report method reduces possible errors caused by individuals and supports model-data fit (Bandalos, 2002; Yang et al., 2010). Different methods are suggested for parceling. For parcelling, a balanced distribution can be achieved by considering item-total correlations, random assignment, and factor loads (Bandalos, 2002). Considering the item factor loads of this research, the psychological well-being scale was divided into two parcels. School Children's Happiness Inventory has two dimensions, each dimension was determined as a parcel and assigned as an implicit variable. On the other hand, structural equation analysis was used to test the hypotheses constructed in the research. While evaluating the results of the structural equation model, χ^2/df, RMSEA, TLI, IFI, AGFI, RFI, CFI, GFI, and NFI model fit indices were used. When evaluating model fit indices, TLI, CFI, and NFI ≥ .90 (Hu & Bentler, 1999), GFI ≥ .85 (Jöreskog & Sörbom, 1988), and AGFI ≥ .85 indicates that the model has an acceptable fit. Similarly, if the RMSEA is below .080, it is interpreted as a good model fit, and if it is less than .010, the results of the model are acceptable (Hu & Bentler, 1999; Tabachnick & Fidell, 2013). On the other hand, x^2/df value of two or less indicates a good fit, and an acceptable fit when it is up to five (Meydan& Şeşen, 2015; Schermelleh-Engel et al., 2003). In this study, while evaluating the model fit indices, the criteria described above were taken into account. In addition, the bootstrapping method was used to determine whether the mediating effect was significant in this study. The bootstrapping method was applied using a 5000 bootstrap resampling technique at a 95% confidence interval. In the literature, it is stated that the calculated values should not include zero to determine that the mediation effect is significant as a result of the Bootstrapping process (Hayes, 2018). Within the scope of this research, the following structural equation model was analyzed.

RESULTS

Descriptive statistics of the scores obtained from the data collection tools are given in Table 1.

**Table 1.** *Descriptive Statistics Findings*

Variables	N	x̄	SD	School Satisfaction	Happiness at School	Skewness	Kurtosis
School Satisfaction	367	25.74	4.40			-.794	-.041
Happiness at School	367	47.87	7.70	.49**		-.665	-.040
Psychological Well-Being	367	89.62	15.06	.64**	.63**	-.610	.134

**p <.01

Only the first letter of the table number and table name must be capitalized. The table number should be bold and the table text should normally be written above the table and left aligned. No text should be written to the left or right of the tables. As seen in Table 1, there are differences between school satisfaction and happiness at school (r= .49, p<. 01), between school satisfaction and psychological well-being (r= .64, p<. 01), and between happiness and psychological well-being at school. (r= .63, p<. 01) was found to be positively significant. In addition, the values of kurtosis and skewness between +1.5 and -1.5 indicate that the data have a normal distribution (Tabachnick & Fidell, 2013).

The Mediator Role of Happiness at School in the Relationship Between School Satisfaction and Psychological Well-Being

In the study, the mediating role of school happiness levels in the relationship between school satisfaction and the psychological well-being of children was examined. The path diagram of the structural equation analysis performed is presented in Figure 2. The model fit indices obtained as a result of the analysis show that the tested model has good fit values [$\chi2$ = 53.216, df = 31, p <.001, $\chi2$/df = 1.78; AGFI = .95; GFI = .97; IFI = .99; TLI = .98; NFI = .97; RFI = .96; CFI = .99; RMSEA = .044 (90% CI = .023 - .064)].
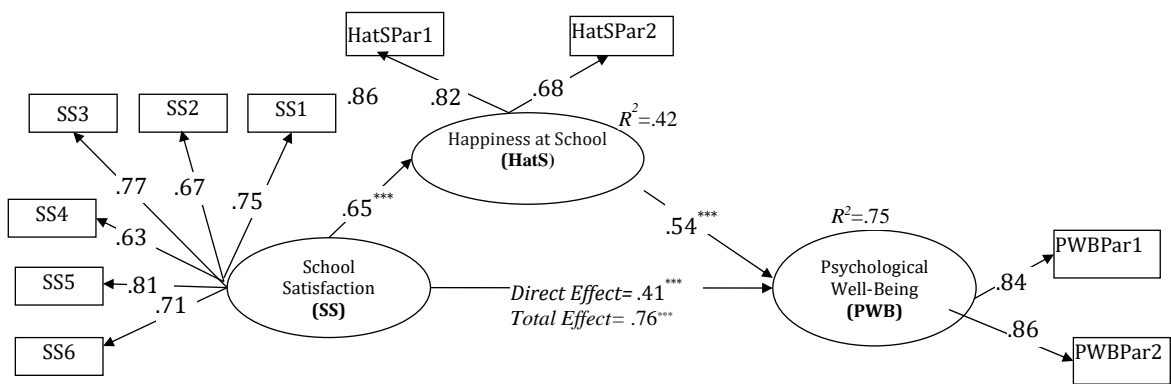
***p<.001

Figure 2. *Path Diagram Regarding the Mediator Role of Happiness at School in the Relationship Between School Satisfaction and Psychological Well-Being*

As a result of the structural equation analysis performed, it was seen that the school satisfaction of secondary school students positively predicted their level of happiness at school (β = .65, p<.001). Similarly, it was found that secondary school students' school satisfaction positively predicted their psychological well-being (β = .41, p<.001). In addition, secondary school students' happiness at school positively predicted their psychological well-being (β = .54, p<.001). On the other hand, it has been revealed that happiness at school has a significant mediator role in the relationship between school satisfaction and the psychological well-being of secondary school students. Bootstrap confidence

intervals were calculated to evaluate whether the mediation effect was significant. It was observed that the confidence intervals obtained did not include zero [β = .35, BC-Bias%95 lower-bound = .242, upper-bound = .509]. This result shows that the mediating role of the variable of happiness at school is significant. In addition, it was concluded that all variables in the model explained approximately 75% of the variance of psychological well-being (R^2 = .75). This result indicates that the model has a high power to explain the variance of psychological well-being. When the results regarding the total effect of school satisfaction on psychological well-being are examined, it is seen that it explains 55% of the assumption regarding psychological well-being (R^2 = .55). However, with the addition of the variable of happiness at school, which is the mediator variable, to the model, it is seen that the model's explanatory power of the hypothesis of psychological well-being increases. All the results obtained in the structural equation analysis are presented in Table 2.

Table 2. *Results of the mediation model*

Pathway	Confidence Interval (*CI*) (*Bias%95*)			R^2
	Coefficient	Lower-bound	Upper-bound	
Total effect				
SS→PWB	.76***	.679	.876	.55
Direct effect				
SS → PWB	.41***	.229	.560	
SS →HatS	.65***	.546	.753	.42
HatS → PWB	.54***	.375	.704	
Indirect effect				
SS → HatS → PWB	.35	.242	.509	.75

***p<.001; N = 367.Note1: SS: School Satisfaction; PWB: Psychological Well-Being; HatS: Happiness at School

DISCUSSION

This study aimed to examine the mediating role of happiness at school in the relationship between secondary school students' school satisfaction and psychological well-being. According to a finding of the structural equation analysis carried out in the research, school satisfaction of secondary school students positively predicted their psychological well-being. According to this result, it can be said that the increase in secondary school students' school satisfaction contributes positively to their psychological well-being. This result shows that the H1 hypothesis of the study was confirmed. In the literature, there is a limited number of studies examining the relationship between secondary school students' school satisfaction and psychological well-being. For example, King, Huebner, and Suldo (2006) reported that there is a positive and significant relationship between school satisfaction and psychological well-being in a study they conducted with secondary school students. In another study, they concluded that their satisfaction with school significantly predicted their subjective well-being (Asıcı & İkiz, 2018). Similarly, in another study, it was seen that students with positive climate perception had a high level of subject well-being (Borkar, 2016). Similar results were obtained in some other studies in the literature (Telef, 2014; Suldo et al., 2012; Verkuyten & Thijs, 2002). It is seen that the current research finding is in parallel with the research results in the literature. When the research findings in the literature and the current research results are evaluated together, it can be stated that the school experiences of secondary school students and the level of satisfaction they get from these experiences are effective on their psychological well-being. In support of this interpretation, it is stated in the theoretical literature that school-age children's experiences at school are important psychological dynamics that affect their psychological well-being, life satisfaction, and happiness (Deiner, 2000; Huebner & Alderman, 1993; Seligman, 2004). In other words, in addition to the knowledge and skills students acquire at school, their level of satisfaction with their friendship relations at school, the school climate, and the relationship they establish with their teachers determine their school satisfaction levels. Many components (school, work, marriage, academic success, interpersonal communication, etc.) from the lives of individuals are effective on their psychological well-being. Therefore, considering that school-age children's time at school covers a

significant part of their time, it can be thought that it is an expected result that students' school satisfaction levels affect their psychological well-being.

According to another finding of the study, school satisfaction of secondary school students significantly predicted their happiness levels at school. This finding can be interpreted as the higher the school satisfaction of secondary school students, the higher their level of happiness at school. With this result, the H_2 hypothesis of the research was supported. When the literature was examined, a study was found that examined the relationship between secondary school students' school satisfaction and their happiness at school. However, in a similar study, it was concluded that secondary school students with a positive school climate perception were happier (Asıcı & İkiz, 2018). In another study, it was stated that secondary school students with high school satisfaction achieved more happiness in their school life (Whitley et al., 2012). In addition, another study examined how children's experiences of happiness at school were conceptualized and as a result, it was seen that friendship relations, academic success, and positive support sources were school-based sources of happiness (López-Pérez & Fernández-Castilla, 2018). Again, in the same study, it was concluded that the academic achievement of the students who had a high level of happiness at school was also high. It can be stated that these research results support the current research findings. In addition to these studies, in a qualitative study examining children's perceptions of the concept of happiness, it was seen that school experiences are among the sources of happiness for children (Yam, 2020). On the other hand, when the literature is examined, it is seen that the concepts of happiness and subjective well-being are used interchangeably (Deiner et al. 2009; Seligman, 2011). Subjective well-being is defined as a psychological structure that includes the positive and negative emotions of the individual and the evaluations made about his/her life (Deiner, 1984). In other words, subjective well-being consists of positive and negative emotions felt by individuals and cognitive judgments about their life (Lyubomirsky & Dickerhoof, 2006). As can be understood from the definitions above, it is seen that life satisfaction, which consists of cognitive evaluations of individuals' lives, also affects their happiness. School satisfaction is known to be an important determinant of school-age children's life satisfaction (Tian et al., 2014). Similarly, Seligman et al. (2009) stated that the satisfaction that students get from their school life supports their level of happiness at school and that this situation will contribute to students' psychological well-being. It is also stated that the cognitive judgments of school-age children about their school life are more effective in their life satisfaction than adults (Huebner et al., 1998; Valera et al., 2017). Considering these explanations, it can be thought that school satisfaction has an effect on the life satisfaction of school-age children, and therefore school satisfaction affects the happiness levels of secondary school students at school. In short, it can be said that the current research findings on the relationship between secondary school students' school satisfaction and their level of happiness at school are also supported by the theoretical literature.

In the study, it was seen that the happiness at school of secondary school students positively predicted their psychological well-being. Looking at this result, it can be stated that as the happiness levels of secondary school students increase at school, their psychological well-being levels will also increase. According to this result, the H_3 hypothesis of the research was confirmed. When the literature is examined, no research has been found that examines the relationship between secondary school students' happiness levels at school and their psychological well-being. However, in some studies, it has been determined that the subjective well-being of secondary school students who have positive feelings about the school climate is higher (Borkar, 2016; Suldo et al., 2012). On the other hand, it is stated in the theoretical literature that school-age children's feelings about their school experiences are effective on their psychological well-being and life satisfaction. (Deiner, 2000; Huebner & Alderman, 1993; Seligman, 2004). However, it can be said that the current research examining the theoretical structure between happiness and psychological well-being is an expected result. Because within the concept of psychological well-being defined by Seligman (2011) there is a component of positive emotions. It is seen that the concept of happiness at school is defined as the positive emotions about the school that occurs in the student as a result of the consistency between the expectations of the student from the school,

his personal needs, and the factors presented by the school and its environment (Engels et al., 2004; Tian, 2008). When these explanations are evaluated together, it can be thought that the happiness levels of students who have positive emotions about their school life increase, and this situation contributes positively to their psychological well-being. Finally, it can be stated that the current research findings on the relationship between secondary school students' happiness at school and their psychological well-being are supported by the results of related studies and theoretical literature explanations.

According to the last finding of the study, it was seen that happiness at school has a partial mediator role in the relationship between secondary school students' school satisfaction and psychological well-being. This result can be interpreted as secondary school students' school satisfaction increases their happiness levels at school, and their psychological well-being increases with the increase in their happiness at school. In addition, when the findings related to the total effect of school satisfaction were examined, it was seen that it explained 55% of the total assumption of psychological well-being. However, it has been observed that school satisfaction has the power to explain 75% of the total variance of psychological well-being through the variable of happiness at school. According to this result, it can be said that secondary school students' school satisfaction affects their psychological well-being positively, but positive feelings about school life contribute to the higher psychological well-being of students. This result shows that the H_4 hypothesis of the research is confirmed. School satisfaction is expressed as the cognitive evaluations made by the student regarding the quality of their school life (Huebner, 1994). On the other hand, school satisfaction is also defined as the level of satisfaction with school life, liking these experiences, and feeling good during the time spent at school (Tian, Chen, & Huanber, 2014). Similarly, the concept of happiness at school is used to express positive feelings about the school formed in the student as a result of the consistency between the student's expectations from the school, his personal needs, and the factors presented by the school and its environment (Tian, 2008). In other words, happiness at school is expressed as the situation in which the student experiences positive emotions more frequently and negative emotions less towards school climate, teacher-student relations, peer relations, and other in-school activities (Løhre et al., 2010; Uusitalo-Malmivaara, 2011). Psychological well-being, on the other hand, is expressed as an existential challenge to all situations that individuals have encountered in their life (Ryff, 1989). In addition, psychological well-being consists of six components: self-acceptance, positive social relations, being autonomous, being able to control one's environment, the meaning of life, and motivation for self-development (Keyes, Shmotkin, & Ryff, 2002). On the other hand, psychological well-being is accepted as an indicator of the physical, emotional, cognitive, and mental health of individuals (Diener et al., 2009). Considering the explanations above, it is noteworthy that the concepts of school satisfaction, happiness at school, and psychological well-being are effective on each other. Based on all these explanations, it can be thought that secondary school students with increased school satisfaction have positive feelings towards school, and this situation makes them feel happy due to their school experiences, and their psychological well-being increases thanks to the increased school satisfaction and happiness. In support of this interpretation, Seligman et al. (2009) stated that the satisfaction that students get from their school life supports their level of happiness at school and that this situation will contribute to the psychological well-being of the students. In a similar study, it was concluded that hope has a mediating role in the relationship between school satisfaction and the life satisfaction of secondary school students (Yam & Kumcağız, 2020). It is seen that the current research findings on the mediation relationship of happiness at school overlap with the related literature and theoretical explanations of positive psychology. On the other hand, the mediating role of happiness at school in the relationship between school satisfaction and psychological well-being is also supported by the Cognitive Therapy Theory developed by Aron Beck (1997). Beck (1997) stated that in this therapy approach that she put forward, dysfunctional negative cognitive judgments are the basis of the psychological problems of his/her individuals. In other words, the cognitive model claims that negative thoughts of individuals cause negative emotions and behaviors in them (Beck & Haigh, 2014). School satisfaction represents students' cognitive evaluations of their school life, and the concept of happiness

at school represents their positive feelings toward school. Based on this explanation, it can be interpreted that secondary school students with high school satisfaction have functional and positive cognitive judgments about the school, and accordingly they feel happy to be in school, and as a result, their psychological well-being increases.

LIMITATIONS AND FUTURE RESEARCH

This research has some limitations as in every research. The first limitation of this study is related to the sample group. The sample group of the study consists of students selected by convenience sampling method among the students in three secondary schools in a city in Turkey. Therefore, care should be taken when generalizing the results obtained in this study to students in other regions of Turkey as well as students from other cultures. In a future study, more generalizable results can be obtained by repeating the current research on a sample group consisting of students from different cultures. Secondly, it should be noted that this study is a cross-sectional study and therefore the results obtained do not contain a cause-effect relationship. For this reason, studies using different research methods can be conducted to better determine the relationships between the variables discussed in the current study. Thirdly, since the data is collected by self-report method, it can contain all kinds of prejudices. This limitation on research results can be controlled by using different data collection methods in future studies. Finally, in this study, the mediating role of happiness at school in the relationship between school satisfaction and the psychological well-being of only secondary school students was examined. In future studies, modeling studies can be conducted using different variables related to school-based experiences that affect the mental health of school-age children.

CONCLUSION

In this study, secondary school students' school satisfaction positively predicted their happiness at school and their psychological well-being. Similarly, it was seen that the happiness of secondary school students at school positively predicted their psychological well-being. These results reveal that children's evaluations of their school-based experiences have an impact on their mental health. In other words, it indicates that school environments only support the academic aspect of children, which will negatively affect their mental health development. In addition, school satisfaction is a component of life satisfaction. Therefore, considering the amount of time school-age children spend at school, it is striking that school satisfaction will have an impact on their psychological well-being, which is an important indicator of mental health. In addition, in this study, it was concluded that secondary school students with high school satisfaction had higher levels of happiness at school. This result reveals that students who have positive thoughts about school and high school satisfaction have higher happiness in their school life. The most striking result of the research is related to the mediating role of happiness at school. Because in this study, it was concluded that there is a partial mediator role of happiness at school between school satisfaction and psychological well-being. This result reveals that school satisfaction contributes positively to the psychological well-being of secondary school students, but students with higher levels of happiness at school have higher psychological well-being levels. All these results reached in the research draw attention to how important school-based experiences are for the mental health of school-age children. In other words, it is concluded that schools are not only places where academic practices are carried out but are very effective institutions for the mental health of children. As seen in the current study, it is seen that children who are satisfied with school-based experiences are psychologically healthier. For this reason, including activities and studies that will positively support children's school-based lives will contribute positively to the psychological health of children. In short, it is seen that it is important not only to take measures to increase academic success in schools but also to include positive psychology practices that will support children's psychological health. In this way, an important step will be taken to transform schools into institutions that support children's mental health.

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Digital Well-Being Scale Validity and Reliability Study

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Article Information	ABSTRACT
	This study aims to develop a reliable and valid scale that measures the hedonic and eudonomic state of happiness of individuals who use digital environments and technologies while using these environments and arising from their use. Digital well-being describes the subjective well-being of individuals in a social environment where digital media and technology are ubiquitous. In this context, a general framework for the link between digital media and technology use and well-being is presented. This framework attempts to identify three important constructs and their interconnections: digital media and technology tools, harms/hedonic happiness and eudonomic happiness. Individuals' digital use story emerges within socio-cultural and technical conditions, shaping environmental conditions. However, this usually causes simultaneous or prolonged harm and benefit. By analyzing the studies in domestic and foreign literature, 140 antecedent items were prepared, grouped and transformed into scale statements and 21 items were determined. The scale was applied to 367 digital technology users. Because of the exploratory factor analysis, 12 items grouped into 3 factors and having sufficient factor loadings (>.40) were selected. The construct validity test for whether the scale consisting of 12 items measures a general construct (digital well-being) and three sub-dimensions named by experts (digital satisfaction, safe and responsible behavior and digital wellness) was conducted using confirmatory factor analysis. Spearman Brown, Guttmann Split Half and Cronbach Alpha values were calculated for the reliability of the whole scale and its sub-dimensions. The Digital Well-Being Scale (DWBS), which was determined to be valid and reliable in the analyses, consists of three sub-factors and 12 items, is intended to be a scale that fills the gaps in the literature, can be developed and used. It is important that future studies on digital well-being prioritize identification, measurement and theory development.

INTRODUCTION

In this study, a scale that would raise awareness about reduced emotional discomfort and emotion regulation, the lack of negative effects, the presence of positive effects on the well-being of individuals who exhibit competence, competent and correct behaviors after and during the use of digital media and technologies was put forward. Well-being generally includes a general assessment of life satisfaction and emotions ranging from depression to happiness (Frey & Stutzer, 2002; Mahon, Yarcheski, & Yarcheski, 2005). Well-being is a positive outcome that is important for many segments of society. Because it tells us that people perceive that their lives are going well. Good living conditions (housing, employment, health) are essential elements for well-being. While studies in the field of psychology have focused on negative emotions such as depression, anxiety and worry in the first century, positive emotions such as satisfaction and happiness have gradually been emphasized (Myers & Diener, 1995).

The feeling of happiness is one of the important factors that affect human life extremely. Therefore, the concept of happiness is discussed in depth in many studies. In this context, Diener proposed the hedonic approach as a modern subjective well-being theory (Diener & Chan, 2011). Hedonism is a philosophical view that explains the meaning of life as being satisfied with pleasure. Although there are different definitions, in general, it is an approach that argues that pleasure is better than all other emotions and that the importance of enjoying all actions that lead to the goal, as well as the effectiveness and accuracy of behavior is directly proportional to the pleasure received (Tilley, 2012). According to Diener and colleagues (2018), subjective well-being is people's self-evaluation of happiness in their own lives. However, Aristotle mentioned that hedonic happiness is a crude ideal and said that true happiness is in virtue. Aristotle says that actions worthy of virtue are already good and beautiful in themselves. Therefore, the idea that happiness is the "best and most beautiful" thing, and that the best and most beautiful is contained in the best activities are accepted (Aristotle, Nicomachean Ethics 19–20). The role of the external environment (political, social, family, relationships, etc.) in creating happiness is considered important. Such a theory differs from the hedonic theory. This is because they argue that behaving only according to their desires is not a requirement for happiness and/or does not always result in well-being. In the eudonomic theory, good life and therefore long-term happiness and well-being are objective rather than subjective. In this research, we adopt an understanding of well-being that is based on both hedonic and eudonomic theories and that is felt during and through the use of digital media and technology or the presence of such media and tools.

Today, the transfer of public and private services such as education, shopping, banking and communication to digital environments has gradually increased the access and interaction of individuals with these environments. Individuals feel free to a great extent in these environments, know almost no boundaries in sharing and normalize sharing the information they encounter without questioning (Kalaman, 2017). When scientific evidence on the problems in the management of the use of digital media and technology in people's daily lives is examined, it is possible to reveal two main thematic concerns. Some studies focus on the concept of "overconsumption" and others focus on the concept of "multi-tasking" (Frey, Benesch & Stutzer, 2007). Overconsumption analyses how and why people consume more digital consumption than they want. On a social media platform, content is constantly encountered and there is no limit to this situation. This situation reveals the problem of digital overconsumption. Multitasking, on the other hand, describes the situation of constantly switching between different foci of attention, which is specific to digital media. For example, while dozens of tabs open in a web browser are for research related to a subject area, a film/music is playing in the other web browser window, and social media notifications are coming from one side; therefore, simultaneous navigation and getting lost between different subject areas or jobs in different dimensions. This situation is referred to as multitasking. Such situations are integrated with each other and cause many emotional or physiological problems due to the use of digital media or technology. At this point, it can be stated that a variable that comes into play is self-control. Under all circumstances, it is in the position of an auditor of human activities, and in the absence of subjective, psychological, or digital well-being, it would be extremely incomplete to state that this is a lack of self-control. The existing complexity

and multidimensionality of the digital media environment are beyond a simple lack of self-control. In the period before digitalization, self-control was considered to play a key role in success and happiness (Mischel, Ayduk, Berman, Casey, Gotlib, Jonides & Shoda, 2011). However, we continue to witness many unprecedented functions of ICT tools. Regardless of the characteristics of individuals, we argue that digital media and technologies push everyone to systematic, fast, intensive and non-linear consumption of information and communication. The developing and updated possibilities of digital environments and technologies trigger individuals to adopt certain behaviors (Heersmink, 2015). Therefore, stimuli and responses in digital environments are highly complex and specific. Here, it is important to have special skills and competencies or to receive support to maintain the well-being of individuals. For this reason, the unique structure of digital environments and technologies and self-control toward them cause a new area of discussion. We care about the features of the digital environment, such as the abundance of possibilities and options offered; the quick and easy transition from focus to focus; the ability to do more than one task with a single device or environment; and the 24/7 continuity of all these. Therefore, it is important to talk about digital well-being and skills.

We define digital well-being as a state in which subjective well-being is maintained in a virtual and technological environment characterized by an excessive increase in media communication. We argue that digital well-being makes an increasing contribution to an individual's overall well-being with both hedonic and eudemonic dimensions (Ryan & Deci, 2001). When evaluated from a broad perspective, digital well-being should be considered not only to reduce the negative effects of digital media and technology or to obtain pleasure, but also to add meaning to the individual's daily life and to ensure self-actualisation. When examined from this aspect, it can be said that at a short-term superficial level, digital well-being only addresses technostress and physiological problems arising from the use of digital media or points to the state of pleasure provided by digital tools and technologies. However, with a more in-depth perspective, in the long term, it points to directing individuals toward their personal and professional goals and reaching the level of self-actualisation in life (Ryff & Singer, 2013).

Advances in psychology, neuroscience and measurement suggest that well-being should be measured with some degree of precision (Kahneman, 1993). However, many indicators that measure living conditions may be insufficient to measure what people think and feel about their lives, such as the quality of their relationships, their positive emotions and resilience, their fulfillment of their potential, or their overall life satisfaction, i.e., their "well-being" (Diener & Seligman, 2004; Diener, 2009). In this context, this study aims to develop a valid and reliable measurement tool that can measure digital well-being.

Well-being in the use of digital media and technology is central to the physical, mental and emotional health of the individual and society. Since digital media and technologies are in active use by all individuals from infancy to old age, it is important to investigate digital well-being states to improve the quality of life. Therefore, this study aimed to examine the digital well-being of individuals. Depending on this purpose, the following sub-objectives will be sought:

➔ How is the construct validity of the digital well-being scale?
➔ What is the reliability status of the digital well-being scale?
➔ What is the level of the participants' digital well-being?

METHOD

Research Design

This study, which develops a valid and reliable scale to determine the level of well-being in digital environments for all individuals using digital technologies, was conducted in a descriptive survey model. The descriptive survey model is a research model that serves to describe the situations experienced or are being experienced as they are (Karasar, 2007) and summarizes the characteristics of the collected data (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2017). For this reason, the survey model was used in this study.

Study Group

While creating the scale item pool, 140 sentences were written separately by the researchers, and 29 items agreed to be included in the item pool, considering situations such as overlapping, distancing from the definition framework, etc. Because of the opinions of educational technology, psychological counseling and guidance and language experts, it was decided to include 21 items in the pilot study. In scale development studies, it is recommended that it would be correct to reach at least 10 times the number of participants in the item pool (Çepni, 2001; Korkmaz, Usta, & Kurt, 2014). Research data were obtained from 367 people who stated that they had used digital technologies in the second half of 2022. The demographic information of the participants is presented in the table below.

Table 1. *Demographic details*

Gender	Male	Female	Total
<14 age	20	23	43
15–24 age	27	42	69
25–34 age	33	73	106
35–44 age	60	42	102
45–54 age	24	16	40
55 age>	6	1	7
TOTAL	**170**	**197**	**367**
Primary School	5	7	12
Middle School	25	42	67
High School	18	20	38
Associate Degree	4	8	12
Graduate	86	101	187
Post Graduate	29	21	50

Establishing the Item Pool

In the first step of the scale development process, the literature on digital skills, competencies (Ertan Özen & Duran, 2017; Yılmaz & Dogusoy, 2020; Tapscott, 1998; Ribble, 2015; Krumsvik, 2008), subjective well-being, psychological well-being (Ryff & Keyes, 1995; Larson & Chastain, 1990), virtual risk (Arslankara & Usta, 2018; Ólafsson, Livingstone & Haddon, 2013), virtual loneliness (Korkmaz, Usta & Kurt, 2014), technostress (Çoklar, Efilti & Şahin, 2017). Some items were written for the basic digital skills analyzed. While creating the items, digital competence, virtual risk, technostress, etc. scales were considered. Many dimensions, especially the items in the scales, were considered and an item pool was started to be created. The researchers wrote 140 sentences for all dimensions. The item pool included 29 items, and 21 items were kept in the pool because of the pilot study and new expert opinion. After the necessary arrangements were made, the scale form with 21 items (15 positive and 6 negative items) was made ready for the actual application. The scale was coded on a 5-point Likert scale with the premises of fully reflects (5), reflects a lot (4), reflects moderately (3), reflects a little (2) and does not reflect at all (1) for positive items; negative items were coded in the opposite way.

Data Analysis

SPSS and AMOS software was used to analyze the data obtained during the development of the scale. Basic component analysis was used to determine the construction validity and factor loads of the scale developed to measure the digital well-being of digital technology users (Büyüköztürk, 2002). In case of suitability for factor analysis, Kaiser- Meyer- Olkin (KMO) coefficient and Barlett Sphericity test results were examined. In the exploratory factor analysis (EFA), 21 items, 6 of which were negative, were coded and the conditions that the variance ratio shared with other items should be 0.30 and the factor loadings should be 0.40 and above were applied to examine the suitability of the items to the selected model. Although the general acceptance value is 0.30 and above, it is stated that 0.50 and above is a better result (Büyüköztürk, 2002). Therefore, this lower limit was determined as 0.40 in this study. Eigenvalue and scree plot was analyzed to determine the number of factors. Because of the factor analysis, item discrimination was

evaluated with an independent sample t-test with 12 items. Additionally, to see how the scale items affect the levels of digital users, the significance of the 27% lower and upper group item scores was analyzed. The validity of the scale, consisting of 12 items was ensured. After the exploratory factor analysis, and s confirmatory factor analysis was conducted. Some value ranges (CFI, GFI, RMSEA, SRMR, NNFI, AGFI, NFI) were considered to verify the acceptability of the scale.

Data Collection

The scale form prepared by the researchers was carried out with the participation of individuals using digital technologies in Sakarya province voluntarily in line with the purpose. With the pilot application, the average response time of the scale was determined as 10 min.

FINDINGS

Findings Related to Validity

Construct validity and item discrimination values were calculated to verify the digital well-being scale. The results obtained are given below.

Construct Validity

Findings Related to Exploratory Factor Analysis (EFA): The KMO coefficient and Barlett's test are used to determine whether exploratory factor analysis should be performed using the data obtained. A KMO coefficient greater than 0.60 and Barlett's test being significant ($p < 0.05$) indicate that the data are suitable for factor analysis (Büyüköztürk, 2002; Hair, Black, Babin & Anderson, 2010). KMO= 0.733 and Barlett test $\chi 2$= 900.800 sd= 120 (p= 0.000). Accordingly, it was decided that factor analysis could be performed using the data obtained. Accordingly, factor analysis was conducted to reveal the dimension structure of the scale. Because of the analysis, a structure consisting of 3 dimensions was obtained. Item loadings were analyzed and 4 items with loadings lower than 0.40 were removed from the scale. At this point, the relevant field experts have consulted again in order not to disturb the content validity. In the next stage, for the overlap control, the factor loadings were re-examined according to the difference of 0.1 between the factor loadings and 2 more items were excluded. Therefore, 9 items were removed from the scale, 12-item final scale was obtained. As a result, it was determined that the items were gathered under 3 factors and explained 49.36% of the total variance. In the last stage, the naming of the factors was done with the support of the literature:

➔ Factor1: "Digital Satisfaction" 4 items,

➔ Factor2: "Safe and Responsible Behavior" 4 items

➔ Factor3: "Digital wellness" 4 items. Accordingly, the distribution of factor eigenvalues is given in Graph 1.
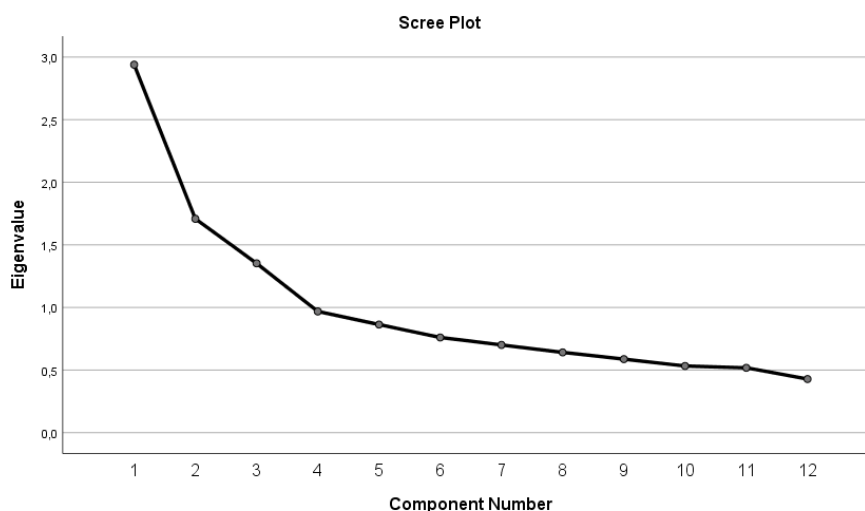

Figure 1. *Slope graph*

Table 2 shows the exploratory factor analysis. As seen in the table, a three-factor structure dimension was analyzed. Item loadings and variance explanation amounts are shown in the table.

Table 2. *Results of exploratory factor analysis*

	Items	F1	F2	F3
1	I can easily adapt to new technologies.	.797		
2	I enjoy spending time with digital technologies.	.814		
3	I care about new digital experiences that can bring different experiences.	.690		
4	In digital skills, I feel in harmony with the people around me.	.514		
5	I care about my digital reputation when using online platforms.		.725	
6	I take care not to exhibit behavior that disturbs other users on social media.		.715	
7	I use digital technology in purposeful meaningful ways.		.541	
8	I always act cautiously against any harm that may come to me in the digital world.		.522	
9	I feel comfortable knowing that someone will see my social media posts.			.745
10	It makes me happy if the posts/stories/statuses I share are liked.			.647
11	A technological problem that I cannot solve makes me angry. (-)			.498
12	If I express myself freely on social media, I think that I will be ostracized by some people in my social networks (-)			.690
	Eigenvalue	2.939	1.708	1.352
	Explained variance	24.491	14.236	11.268

As shown in Table 2, the "digital satisfaction" dimension of the scale includes 4 items and the factor loadings are in the range of 0.514–0.797. When the whole scale is analyzed for this factor, it is seen that the eigenvalue is 2.939. It is seen that it has the power to explain 24.491% of the overall variance. The "safe and responsible behavior" factor of the scale consists of 4 items. Factor loadings are in the range of 0.522–0.725 and the eigenvalue is 1.708 and the variance is 14.236. When the "digital wellness" factor is examined, it is seen that it consists of 4 items. Factor loadings are in the range of 0.498–0.745. The eigenvalue of the factor is 1.352 and its variance is 11.268%.

Findings Related to Confirmatory Factor Analysis (CFA): because of the exploratory factor analysis, a scale consisting of 12 items with 3 factors was obtained. Confirmatory factor analysis was performed using AMOS software with the data obtained from the analysis. Confirmatory factor analysis is used to determine the relationship between factors, the relationship between variables and factors, and the level of explanation of factors to the model (Brown, 2015).

Table 3. *Comparison of research results with standard goodness-of-fit measures*

Fit Dimensions	Perfect Fit	Acceptable Fit	Research Data
χ2/sd	0 ≤ χ2/sd ≤ 2	2 ≤ χ2/d<5	2.298
RMSEA	0 ≤ RMSEA ≤ .05	.05 ≤ RMSEA ≤ .08	0.060
S-RMR	0 ≤ S-RMR ≤ .05	.05 ≤ S-RMR ≤ .10	0.072
GFI	.95 ≤ GFI ≤ 1	.90 ≤ GFI ≤ .95	0.954
AGFI	.95 ≤ AGFI ≤ 1	.90 ≤ AGFI ≤ .95	0.923
CFI	.97 ≤ CFI ≤ 1	.95 ≤ CFI ≤ .97	0.909
NFI	.95 ≤ NFI ≤ 1	.90 ≤ NFI ≤ .95	0.853
IFI	.95 ≤ IFI ≤ 1	.90 ≤ IFI ≤ .96	0.911

Source: Schermelleh-Engel-Mooesbrugger-Müler (2003); Byrne (2011); Çokluk (2014).

Confirmatory factor analysis results are given in Table 3. According to these results, it was determined that the NFI value was not within the specified value range, while the RMRSEA, SRMR, GFI, AGFI, CFI, NFI and IFI values were at acceptable fit values. The factorial model and factor-item structure of the scale are given in Figure 2.
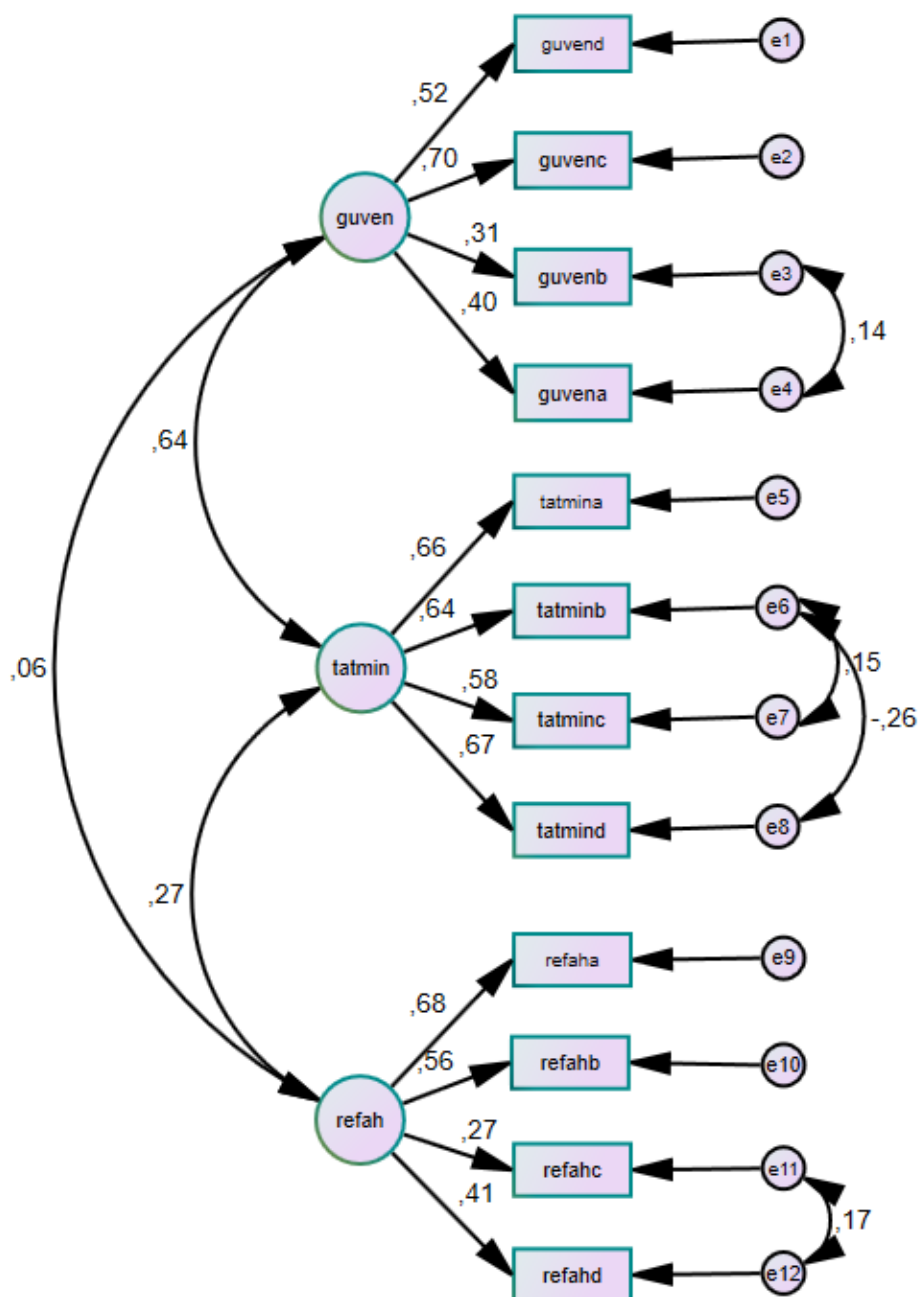
Figure 2. *Confirmatory factor analysis link graph of the scale*

Item Factor Correlations

Item-total correlation method was used to determine the degree to which the items serve the purpose. In this method, the correlations between the item scores and factor scores were determined and the degree of usefulness was determined. The item-factor correlation values of the items are shown in Table 4.

Table 4. Item factor correlations

F1 Digital satisfaction		F2 Safe and responsible behavior		F3 Digital wellness	
Item	r	Item	r	Item	r
S1	.791(**)	B1	.709(**)	W1	.456(**)
S2	.659(**)	B2	.543(**)	W2	.733(**)
S3	.685(**)	B3	.706(**)	W3	.385(**)
S4	.730(**)	B4	.695(**)	W4	.660(**)

When the item-factor correlation coefficients given in Table 4 are examined, it is observed that the values between 0.659 and 0.791 in the digital satisfaction factor; between 0.543 and 0.709 in the safe and responsible behavior factor; and between 0.385 and 0.660 in the digital wellness factor. Each item was found to have a positive and significant relationship with the whole scale (p<0.001). According to this result, when the item-factor correlation values are considered, it is seen that each item in the scale serves the purpose.

Item Discrimination

With the calculation of the discrimination power of the items prepared to develop the scale, the results obtained from the individual items are ranked from the largest to the smallest. Lower 27% and upper 27% groups are found. Independent sample t-test analysis was applied to the lower and upper groups. The t-values indicating the discrimination power are shown in Table 4.

Table 5. Item discrimination

F1 Digital satisfaction		F2 Safe and responsible behavior		F3 Digital wellness	
Item	**t**	**Item**	**t**	**Item**	**t**
S1	-15.456	**B1**	-10.773	**W1**	-4.430
S2	-9.749	**B2**	-5.228	**W2**	-7.598
S3	-10.222	**B3**	-16.016	**W3**	-3.677
S4	-16.016	**B4**	-13.776	**W4**	-8.584
Total (F)	-21,431		-20,526		-13,016
Total Scale	-35,016					

When Table 5 is analyzed, it is seen that the values found by the independent sample t-test for the 12 items, factors and factor total are between -3.677 and -16.016. The total t-value of the scale is -35.016 and all results are significant (p<0.001). Accordingly, it can be said that the discrimination level of the scale is high.

Findings Related to the Reliability of the Scale

To calculate the reliability of the scale, the analyses were examined.

Internal Consistency Level

Considering the factors and the whole scale, Spearman Brown, Cronbach Alpha and Guttmann Split-Half reliability coefficients were analyzed. Reliability coefficients are given in Table 6.

Table 6. Factor reliability coefficients

Factors	Item Number	Spearman Brown	Gutt-mann Split-Half	Cronbach's Alpha
F1: Digital satisfaction	4	.817	.816	.808
F2: Safe and responsible behavior	4	.676	.741	.730
F3: Digital wellness	4	.571	.570	.663
Total	**12**	**.728**	**.751**	**.791**

When Table 6 is analyzed, Spearman Brown coefficient of the scale consisting of 12 items and 3 factors is 0.728; Guttmann Split-Half is 0.751; Cronbach's alpha value is 0.791. Spearman Brown coefficient of the "Digital Satisfaction" factor is 0.817; Guttmann Split-Half is 0.816; Cronbach's alpha value is 0.730. The Spearman Brown coefficient of the "Safe and Responsible Behavior" factor is 0.676, Guttmann Split-Half is 0.741 and Cronbach's alpha is 0.730. The Spearman Brown coefficient of the "Digital Wellness" factor is 0.571, Guttmann Split-Half value is 0.570; Cronbach's alpha value is 0.663.

Therefore, it can be said that the reliability coefficient of the sub-factors of the scale is good (Eroğlu, 2008; Kline, 1994). Accordingly, it was concluded that the scale items and the whole scale made reliable and consistent measurements.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

The current study develops a valid and reliable scale to determine the digital well-being of individuals who use digital technology environments and tools for to use of these environments. Because of the study conducted for this purpose, the Digital Well-Being Scale consisting of 3 factors and 12 items was developed.

The factors of the scale are named as follows.

➔ The first factor is "Digital Satisfaction" consisting of 4 items,
➔ The second factor is "Safe and Responsible Behavior" consisting of 4 items,
➔ The third factor is "Digital Wellness" consisting of 4 items,

When naming the factors, the concept of satisfaction was used as they are items that reflect the harmony, pleasure and positive feelings provided by digital technology, tools and environments. According to the Turkish Language Association (2022), satisfaction means "achieving the realization of something desired, reaching contentment, fulfillment". Therefore, this factor was named as "digital satisfaction" when it was considered to be enjoying and feeling pleasure while being intertwined with digital skills. The second factor was named safe and responsible behavior. Schuler (1992) mentions 4 types of behavior in communication with people. These are avoidance, attack, redirection and safe behavior. Safe behavior includes protecting one's own rights by respecting the rights of others, protecting one's personal life and wishes, and establishing good relations with the environment. In addition, using digital technologies in a meaningful and correct way is also a requirement of a sense of responsibility. Therefore, the behavior should be both safe and responsible. Acting responsibly is a basic skill that should be acquired at an early age (Sürücü, 2007). Since the items in the second factor are thought to indicate the behaviors mentioned above, it was deemed appropriate to name this factor as safe and responsible behavior. The third factor was named as digital wellness. When we look at the action expressions in the items, we see that there are expressions of relaxation, happiness, anger (negative item). The concept of wellness is defined as "making people feel healthier and happier" (Cambridge Dictionary, 2022). For this reason, it was thought that feeling relaxation and happiness with digital environments and technologies could be better explained with this concept.

The scale was prepared as a 5-point Likert scale. Positive items were coded with the premises of fully reflects (5), reflects a lot (4), reflects moderately (3), reflects a little (2) and did not reflect at all (1); negative items were coded oppositely. The results of the exploratory factor analysis revealed a four-dimensional scale. In the distribution of the dimensions, values with item factor loadings greater than 0.40 were selected for the dimensions. Because of the construct validity analysis, factor loadings, variance explanatory power and eigenvalues were analyzed, and it was seen that the construct validity of the scale was at an appropriate level. After the exploratory factor analysis revealed that the scale consisted of four factors, confirmatory factor analysis was conducted to confirm the factor structures. Confirmatory factor analysis showed that the scale model was confirmed by the data. The reliability results of the scale were determined using Spearman Brown, Guttman split-half and Cronbach's alpha values. These values show that the scale can provide reliable measurements. A reliability coefficient greater than 0.60 has a significant effect on reliability (Büyüköztürk, 2002). Because of the independent samples t-test conducted to determine the difference between the upper and lower 27% groups in item discrimination, the discrimination of the scale items and the entire scale was found to be high. The item factor correlation value was found to be good. As a result, it can be said that the digital well-being scale can be used as a valid and reliable measurement tool to measure the positive and negative emotional-psychological-physiological bonds of individuals using digital technologies with digital environments.

When the literature is examined, there are several scale studies on digital environments. For example, the Digital Well-Being Scale study conducted by Öztürk (2018) consists of 2 factors and 12 items. The factor names are "ability to manage digital platforms" and "sharing personal information for official purposes". It can be said that the scale statements were created within the framework of eudaimonomism. The subjective well-being of individuals towards digital skills or the use of digital technologies is emphasized. Kara (2019)

conducted a Digital Well-Being Scale study with university students. There are 12 items in total as 4 factors. It is seen that the scale is within the framework of hedonism, which is equivalent to the practices and strategies that Google company shares with users under the name of "digital balance". We carry the idea that this point should be differentiated from the concept of digital well-being. Digital well-being is much more than digital tools or applications based solely on pleasure interaction. Arslankara and Usta (2018) developed the Virtual World Risk Perception Scale. Consisting of 5 factors and 25 items, the scale measures threat and opportunity perceptions of virtual environments. The factor names are "Virtual Corruption", "Virtual Fraying", "Virtual Offer", "Virtual Facility" and "Virtual Awareness". In the Online Privacy Awareness Scale study by Korkmaz, Vergili, and Karadaş (2021), there are 3 factors and 17 items, and the factor names are "Attention", "Security" and "Communication". The scales in the literature were analyzed in terms of the number of factors and items. As can be seen, these scales developed in the literature focus on happiness, threat and opportunity perception related to digital technology and environment, and online privacy. In the scale developed in this study, the concept of Digital Well-Being was tried to draw a more general and inclusive framework with both the pleasure arising from the use of technology and the state of peace that it adds to the individual's daily life. In this respect, it can be said that the scale differs from other scales and will contribute to the literature.

When the relevant literature is examined, among the basic skills, competencies and qualities expected to be in individuals who are intertwined in digital technology and environments, there are the following indicators: having digital competence, following situations such as health and sports with digital platforms and tools, showing safe and responsible use behaviors when using digital services, managing digital workload appropriately, considering concerns about other people and the environment when using digital tools. One of the first sources to address the concept of digital well-being was a report published by the Royal Society for Public Health (RSPH) in 2017. While the report provided detailed data on how young people are affected by social media, it also began drawing attention to digital well-being skills. Additionally, the skill areas of information and data literacy, communication and collaboration, digital content creation, digital safety and problem solving through the creative use of digital technologies are also considered within the scope of digital well-being, as outlined in the European Commission's (2016) 'Digital Skills Framework for 21st-Century Citizenship'.

In a study conducted in the UK, it was found that young people use their mobile phones even during classes, do not leave home without their mobile phones and more than half of them even worry about losing their mobile phones (Pavithra & Madhukumar, 2015). In another study, it was found that nine out of every ten people had sleep problems because they stayed up late due to activities such as browsing social media, chatting, and playing games. About 78% of these people check their mobile phones before going to bed, and this rate increases to 91% among people aged 18–24 (Singh & Yadav, 2015).

With this scale, it is thought that a measurement tool that can measure the competence, skills and emotional well-being of individuals using digital technology and environments has been introduced to the literature. The validity and reliability studies of the scale were conducted with 367 individuals aged 14–62. When the reliability of the sub-factors in this scale was evaluated, it was found that the digital wellness sub-factor had the lowest reliability. It is thought that the reason for this may be that the tasks in this section contain negative items and students may not be able to understand them. For this reason, it is recommended not to use negative items in scale development studies, especially when creating items for younger students.

Limitations

There are findings in the literature that EFA and CFA cannot be conducted with the same data set. However, since a different data set could not be created in this study, both EFA and CFA were conducted using the same data set.

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The Effect of the Enriched Book (E-Book) Supported Instructions on the Students' Academic Success and Attitude to Physics

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Article Info	ABSTRACT
	This research was carried out to determine the effect of enriched book (z-book) supported instruction on students' academic success towards the pressure unit and their attitudes towards physics. In the research, a quasi-experimental research design with pre-test post-test control group was used. The research was applied to 42 students in two branches of the 10th grade students studying at Vocational and Technical Anatolian High School in the Suluova district of Amasya province in the 2021-2022 academic year. In the research, a physics achievement test consisting of 20 questions, the validity and reliability of which was tested with a pilot application, was used. In the process, the pressure unit was explained to the experimental group students by using Z-book supported teaching. Subject gains were given to the control group by using the current curriculum. At the end of the process, it was analyzed whether there was a significant difference in the academic achievements and attitudes of the students in the experimental group towards the physics course. According to the results of the analysis, it was determined that the academic achievement of the students was significantly different from the students in the experimental group who received e-book supported education from the students in the control group who received traditional lectures. It was concluded that there was no significant change in the attitudes of the students towards the Physics course in both groups

INTRODUCTION

It is known that Physics has an important place in science and education programs. Physics is known as a branch of science that expresses cause and effect relationships in our environment scientifically and examines the interaction of matter and energy (Aycan & Yumuşak, 2003). The science of physics contributes to the developing science by examining the events in nature (Wambugu & Changeiywo, 2008). Therefore, understanding and interpretation of physics is important. However, physical science, by its nature, includes abstract concepts and is difficult to understand by students.

It is known that physics is among the courses that students have difficulty in understanding from time to time because it includes abstract concepts. The important thing is to transform abstract concepts into concrete ones and make them comprehensible (Lakoff & Johnson, 1980: 115). For this reason, the use of visual content is an important situation in concretizing abstract concepts in the subject content (Kruteskii, 1976). One of the most important goals of the physics course is to provide students with an understanding of basic physics concepts and to enable students to be successful in this field. Studies have revealed that the inadequacy of teaching methods, time factor, material deficiencies, students' lack of knowledge and teacher characteristics are the factors that most affect the learning status of students (Bozan, Küçüközer & Işıldak, 2008). Using technology in physics lessons can increase the academic success of students. The use of technology products such as smart boards and similar tools in classrooms is very important (Buzkan, Ersoy, Çiço & Ceni, 2016). It is inevitable that the books used in teaching will be replaced by technological applications (Minor, Bracken, Geisel, & Unger, 2006). At the same time, the use of technology in Physics course can enable students to develop a positive attitude towards Physics course. It has been stated that using technology resources in the lessons increases the student's desire to learn (Mambaeva, 2018). Likewise, different methods and techniques used in teaching cause an increase in the level of education.

As a matter of fact, many technology-supported studies have been carried out to increase the success of students in Physics lessons. It has been determined that these studies increase student achievement. (Karamustafaoğlu & Aydın, 2005; Atayev, 2019; Öztürk, Akdeniz & Bakırcı, 2017; Erdem & Uzal, 2018; Tekdal & İlhan,2021). As it is known, computers have features that increase learning in learning and provide convenience to the teacher in terms of use. In this context, many software has been made in line with the need. One of them is the E-book. The 21st century is known as the age of science and there are rapid developments and changes in the fields of science and technology (Şahin, 2017). It is also stated that the self-confidence and competence of students who use technology actively during their education increase (Rugayah, Hasbim, &Wan, 2004). It is said that the use of technology in students' learning environments both increases the permanence of students and is useful in terms of time (Korkmaz & Ünsal, 2016: 32). FATIH (Movement to Increase Opportunities and Improve Technology) project, which started a new technological era in education in Turkey, was carried out. Thanks to this project, many technological tools and equipment support were provided to our schools and made available for use. FATIH project tried to provide equal opportunity in education and aimed to reduce the education and training gap in regions with different levels of development (Gökmen & Akgün, 2016). Ertekin (2016) examined the level of use of the smart board and the opinions of the teachers on the subject and concluded that the use of the smart board attracts the attention of the students, motivates them towards the lesson, is useful by the teacher, students are more active in the lesson and many technological features of the smart board can be used. Uzun and Sunal (2017) examined the perceptions created using smart boards in the Physics course in their research and concluded that the use of smart boards at a high rate created positive opinions. Some of the participants concluded that the use of interactive whiteboards did not make any difference in learning. Yıldırım (2016) talked about the importance of using smart boards in lessons and concluded that the use of smart boards had positive effects on students' attitudes. In addition, it is stated that the most important factor determining the way this project achieves the desired results is the teachers (Öçal & Şimşek, 2017).

With the developing technology, the content needed within the scope of the FATIH project also develops over time. Enriched books are also seen as important tools in providing these contents. E-book; It can be considered as digital content with many variable elements that appeal to many visual and auditory areas. These contents can also interact with the user (Bozkurt & Bozkaya, 2013). The E-book, defined by the Ministry of National Education, is defined as the digital material that comes together with the elements containing images and sounds added on the computer format of the textbooks used as a course tool in schools, without changing the content (MONE, 2011). The e-book is used as a digital media material that enriches the content with visual and technological elements and provides convenience to the user.

This research was carried out to determine the effect of enriched book (e-book) supported teaching on the academic achievement of the students in the pressure unit and their attitudes towards the physics course. In previous studies, it has been determined that abstract concepts in Physics course affect students' learning. It is thought that e-books can contribute to the concretization of abstract concepts. For this reason, the use of e-books, which are advantageous in terms of content, has been found appropriate. It is possible to come across studies on e-books in the literature. Yanlız Hakkari, Yeloğlu, Tüysüz, and İlhan (2007) used the material they created with the support of e-books in a unit in the chemistry course and concluded that this contributed significantly to the academic success of the students. Önder and Sılay (2016), in their study on pre-service teachers, concluded that the computer programs with increased content with e-books they used in laboratory activities caused a positive change in the attitudes of pre-service teachers. Varol, Özer and Türel (2014) conducted a study that is thought to contribute to the e-books to be developed by determining the strengths and weaknesses of the e-book, after examining the ideas for the z-book designed for the ARCS model. Ormancı (2018) used the example of an e-book in internet-supported science material in his study and concluded that the z-book caused an increase in students' conceptual understanding in the results he obtained in the research inquiry approach. In his study, Doğan (2018) examined the e-book applications of students in learning foreign languages and concluded that the e-book was useful for the instructors in his examination. However, it is seen that the studies in the literature on the use of e-books, which are a content produced by the development of technology, are quite limited. For this reason, the effect of e-book use was investigated in this study. Especially in the literature review, it was seen that the use of e-books was used in studies in many fields, but its success-enhancing effect was not discussed within the scope of Physics course.

Another researched subject is how e-book supported learning will affect students' attitudes towards Physics course. Attitude is seen as a substructure of behavior (Anderson, 1988). It was stated that for a meaningful Physics teaching, students should be willing to the lesson (Whitelegg & Paryy, 1999). In previous studies, it was investigated how different methods used in teaching affected students' attitudes towards Physics. However, there are no studies in the literature examining the attitude of e-book application on physics lesson. The effectiveness of different methods was investigated and some of the results were as follows. In their experimental research, Çağan, Kızılcık and Yavaş (2020) investigated how the physics attitudes of the students participating in the TÜBİTAK science fair changed and concluded that the attitudes of the students were positively affected, but there was a statistically significant change only in their anxiety levels. Pehlivan (2019) examined the attitudes towards Physics in science high schools and concluded that student attitudes were different according to grade levels. In his study, Pehlivan (2019) tested students' attitudes towards Physics with an inquiry-based teaching model and concluded that it had a positive effect on students. In their research, Moğol and Eke (2017) investigated the effect of cooperative learning method on physics course and as a result, they showed a positive trend in their academic achievements and attitudes. Hırça (2012) investigated the results of the context-based technique he applied in his study on students' understanding of the physics lesson and their attitudes towards Physics and concluded that the approach was more effective than the traditional method in student attitudes. In their study, Mun and Abdullah (2016) concluded that

the use of smart boards increased the success of students and their course attitudes changed positively. Hırça, Çalık and Seven (2011) examined the change in students' conceptual knowledge and their attitudes towards physics lesson based on the material developed according to the 5E method. In his study, he concluded that the materials caused a change in the attitudes of the students. Tekin (2013) stated that the use of smart boards within the scope of the Fatih project in Physics teaching changed both the success of the students in the physics course and their attitudes and opinions towards Physics. Şalgam (2009) investigated the effect of the problem-based learning method he used in the physics lesson and found that this application did not create a different situation or change in the attitudes of the students towards physics. The data obtained as a result of this research will determine how e-book supported teaching will change the attitudes of students towards physics lesson and will guide the future studies.

The digital content that started to be used in Turkey with the smart board technology will become more widespread in time. The effectiveness of using enriched books (e-books), which is one of them, could not take its place in the literature, and the researches were insufficient. This research was conducted to find answers to the questions of how effective the use of e-books is on the Physics lesson, how much it contributes to student success compared to the traditional lecture method, and how much it changes the attitudes of the students towards the physics lesson.

Problem Statement

What is the effect of enriched book (e-book) supported instruction on students' academic success towards the pressure unit and their attitudes towards physics?

Sub-problems

1. Does enriched book (E-book) supported instruction significantly contribute to the success of students in the Physics course?

2. Does enriched book (E-book) supported instruction significantly contribute to students' attitudes towards Physics lesson?

METHOD

Research Design

In this study, students' academic achievements in the pressure unit and their attitudes towards physics lesson in enriched book (e-book) supported instruction were examined using a quasi-experimental research design with pretest-posttest control group. This research design is used in studies where all variables cannot be controlled (Aydede & Matyar, 2009). In this framework, two groups were determined and randomly one of them was determined as the experimental group and the other as the control group.

Study Groups

The study group of the research consists of two classes randomly selected from the 10th grade students studying at a Vocational and Technical Anatolian High School located in a district center in Amasya in the 2021-2022 academic year. The study group was determined by easy sampling. It is stated that the studies will progress faster with the selection of this method (Yıldırım & Şimşek, 2008). The distribution of the study group by groups and gender is summarized in Table 1.

Table 1. *Distribution of the students by group*

Groups	Female	Male	Total
Experiment Group	0	21	21
Control Group	0	21	21

In the Vocational and Technical Anatolian High School, where the students in the experimental

and control group receive education, there are electrical and electronic technology, motor vehicle technology, machinery and design technology, metal technology and furniture and interior design fields. These areas train intermediate staff to respond to industrial needs and are preferred by male students. Therefore, there were no female students in the study group.

Data Collection Tools

The academic achievement test consists of 30 multiple choice questions. These questions were prepared in accordance with the level of the student by examining the achievements determined in the education program. A table of specifications related to the achievements was created, and the question distribution was made in accordance with the achievements. The distribution of 30 questions in the specification table is given in the table.

Tablo 2. *Achievement test specification table*

Gains	knowledge	Understanding	Practice	Analyses	Synthesis	Evaluation	Total
"Explains the variables on which the concepts of pressure and pressure force depend on solids, static liquids and gases".	1, 2, 3, 4, 5, 7, 11 14, 15, 6, 17, 19, 25, 26	6, 8, 10, 24, 29, 28	9, 12, 13, 30				24
"Relates flow velocity and fluid pressure in fluids".		18, 20, 21, 22, 23, 27					6

It was aimed to determine the effect of the Enriched Book (e-book) application used in the research on the academic success of the students in the Physics course. For this purpose, a draft scale form consisting of 30 questions was created by the researcher within the scope of the 'Pressure' unit. The obtained scale form was examined by two field experts and their evaluations regarding content validity and suitability of the items were taken. In this direction, necessary corrections were made and the draft scale form was given its final form. A pilot study was conducted by applying the prepared draft scale form to 102 11th grade students. As a result of the pilot study, items with a discrimination index below 0.30 were removed from the test and a test consisting of 20 items was obtained. At the end of the pilot study, the Kr-20 value of the test was determined as 0.8165, the average difficulty index was determined as 0.47, and the distinctiveness values of the questions are summarized in Table 3.

Table 3. *Discrimination levels of achievement test items for physics course*

Item No	Discrimination	Item No	Discrimination
I1	0,51	I11	0,33
I2	0,59	I12	0,51
I3	0,40	I13	0,51
I4	0,51	I14	0,55
I5	0,59	I15	0,62
I6	0,70	I16	0,51
I7	0,40	I17	0,62
I8	0,77	I18	0,37
I9	0,62	I19	0,44
I10	0,62	I20	0,40

Accordingly, it can be said that the scale can measure the academic achievement of the students in the Physics course in a valid and reliable way.

In this study, the Physics Attitude Scale prepared by Tekbıyık and Akdeniz (2010) was used to analyze students' attitudes towards physics lesson. The scale consists of 4 factors and 30 items. It was prepared in a 5-point likert type. The factor names are Importance, Comprehension, Need and Interest. There are 10 items in the Importance factor, 7 items in the Comprehension factor, 7 items in the Needs factor, and 6 items in the Interest factor. It was determined that the factor loads of the items were between 0.532 and 0.812. The 4 factors explain 48% of the total variance. Cronbach Alpha coefficients of the factors; 0.838, 0.795, 0.749, 0.717 and 0.873 for the whole scale.

Experimental Process

In the experimental group, training was carried out using the Pressure Unit, enriched book (e-book) for 4 weeks and 2 hours a week. The e-book published by Çap Yayınları was used in the experimental process. The tools in the e-book were tried to be used effectively during the lecture. In summary, the applications made according to the weeks in the experimental group are as follows:

1. Week

Gains: Explains the variables that the concepts of pressure and pressure force depend on in solids, stagnant liquids and gases.

a) "Students are provided with examples from daily life of the effects of pressure on our lives. The effects of pressure on state change are emphasized".

b) "Mathematical models of solid and stagnant liquid pressure and pressure force are given. It does not enter into components and mathematical calculations".

Under the title of solid pressure in the e-book, the definition of solid pressure, the unit table, and the physical expression of solid pressure were explained to the student. The force diagrams were given to the student over 3 figures under the title of solid pressure applications. Example images from the z-book are given in Figure 1 and Figure 2.
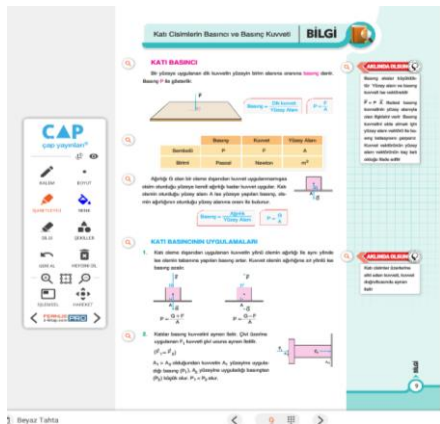
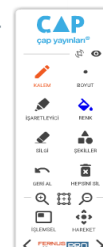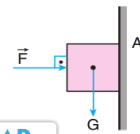**Figure 1.** *Pressure and Compressive Force of Solids*

Figure 2. *Pressure Force Diagram*

The effects of pressure on daily life are exemplified by 5 items in the e-book. The effects of pressure on phase change were explained with examples from daily life. The application area diagram questions, table fill-in-the-blank and problem questions on the 12th and 13th pages of the e-book were solved with the active participation of the students by using the e-book features. These pages are given in figure 3 and figure 4.
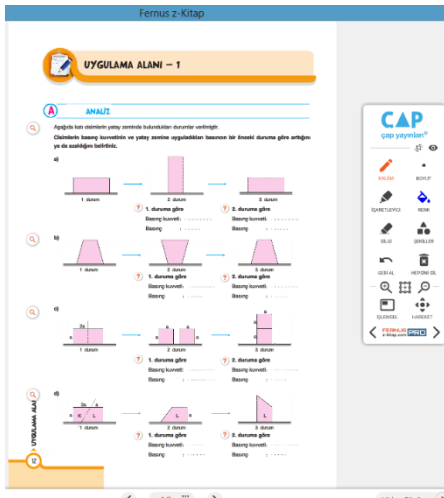
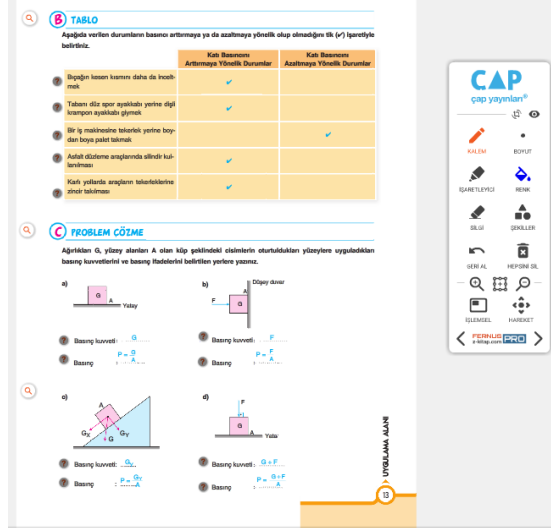**Figure 3.** *Basınç diyagramı etkinlikleri*

Figure 4. *Katı basıncı alıştırma-2*

The end-of-unit questions on pages 14-18 of the e-book were solved using the video feature. The reinforcement questions on pages 17-18 were given to the students as homework. On page 24, the static fluid pressure variables are obtained. Fluid pressure variation was interpreted with graphs. On page 34, the pressure force variables were examined, and the activities and graphics on page 35 were examined with e-book auxiliary tools.

2.Week

Gains: c) "The Torricelli experiment is explained and the difference with capillarity is indicated".
ç) "Information about barometer, altimeter, manometer and bathymeter, which are measuring instruments working with pressure effect, is given".

d) "Pascal's Principle is mentioned. Mathematical models of gas pressure and Pascal's Principle are not given".

The toricelli experiment is explained along with the open-air pressure on pages 49 and 50 of the e-book. The sample form of the outdoor pressure in the e-book from daily life was examined with the students. The toricelli experiment and capillarity comparison tables in the e-book were provided to be interpreted by the students. The definitions of pressure measuring instruments on pages 50 and 51 were made and their visuals were examined. The areas of use in daily life were mentioned. Pascal's principles are examined on pages 41 and 42. Pressure changes on the vessels were interpreted. The questions at the end of the chapter were solved with video support.

3. Week

Gains: Establishes a relationship between flow velocity and fluid pressure in fluids.
a) "By using experiments or simulations, a connection is established between cross-sectional area, pressure and fluid velocity".
b) "The Bernoulli Principle is explained through examples from daily life (such as flying roofs, inverting umbrellas, doors closing hard in windy weather)".
c) "Mathematical calculations related to Bernoulli's Principle are not entered".

Bernoulli's principle on page 65 was derived by examining the relationship between velocity and pressure of fluids. The figures given in the e-book were examined. On page 65, the explanation of the bernoulli principle is provided by associating the examples in daily life with the principle.

4.Week

Gains: "The conveniences that fluid pressure can provide in daily life (such as the flying of airplanes) and the health and safety measures to be taken against its negative effects are emphasized".

281

The positive and negative effects of the examples given in the 3rd week were discussed. Information about security measures has been given. On pages 66, 67, 68 and 69, the end-unit questions were completed with the help of student active participation and video solutions.

The control group students were given the same gains in the experimental group by applying the current curriculum of the Pressure unit for four weeks, two hours a week. The achievement test prepared for the control group was applied as a pre-test. At the end of the four-week period, the same test was applied as a post-test. The physical attitude scale was also applied to the control group before and after the process. The following activities were carried out in the control group according to the weeks.

1.Week

The topics on pages 71 to 85 in the textbook provided by Mone were explained to the students using the direct lecture method. Solid, liquid and gas pressure definitions were made by the teacher, the variables were written on the board and the students were allowed to take notes. The sample questions in the book were solved by the teacher.

2.Week

The topics in the textbook, ranging from 85 to 91 pages, were explained to the students by using the straight lecture method. Torricelli experiment was drawn on the board and transferred to the student. The definitions of pressure measuring instruments were made by the teacher, and the students were allowed to take notes.

3.Week

The subjects in the course book, ranging from 92 to 95 pages, were explained to the students by using the straight lecture method.

4.Week

The unit evaluation questions on pages 105 - 108 of the textbook were solved by the teacher by writing them on the board.

Analysis of Data

SPSS program was used in the analysis of the data. Whether the physics achievement pre-test, which was prepared to measure academic achievement, which is the variables to be tested during the research process, shows normal distribution or not, was analyzed with the Kolmogorov Smirnov test and the findings are summarized in Table 4.

Table 4. *Experimental and control group achievement pretest and attitude pretest normality distribution analysis*

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	p	Statistic	df	Statistic
Achievement Pre-test	,145	42	,026	,960	42	,142
Attitude pre-test	,129	42	,077	,953	42	,082

When the table is examined, it is seen that the physics achievement pre-test does not show a normal distribution (p= 0.026<0.05), but the attitude towards Physics Lesson pre-test scores show a normal distribution (p=0.086>0.05). In addition, the normality levels of the data were investigated by examining the kurtosis and skewness coefficients and summarized in Table 5.

Table 5. *Experimental and control group achievement pre-test kurtosis and Skewness coefficients*

		Stat.	Sh
Achievement pre-test	Mean	33,10	2,561
	Media	30,00	
	Variance	275,552	

		Stat.	Sh
	Std. devieation	16,600	
	Minimum	5	
	Maximum	80	
	Ranj	75	
	Skewness	,482	,365
	kurtosis	,515	,717
Attitude Pre-test	Mean	90,14	2,962
	Media	90,00	
	Variance	368,467	
	Std. devieation	19,195	
	Minimum	30	
	Maximum	135	
	Ranj	105	
	Skewness	-,628	,365
	kurtosis	1,022	,717

Since the skewness and kurtosis coefficients are between −1.5 and +1.5 in Table 5, it was decided that it can be assumed to be normally distributed (Büyüköztürk, 2013). The achievement post-test and attitude post-test scores of the experimental and control group students were analyzed with the Kolmogorov Smirnov test whether they showed normal distribution. The findings are summarized in Table 6.

Table 6. *Experimental and control group achievement and attitude posttest normality test*

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	p	Statistic	df	Statistic
Achievement Post-test	,173	42	,003	,939	42	,026
Attitude Post-test	,111	42	,200[*]	,945	42	,041

When Table 6 is examined, it is seen that the achievement post-test scores do not show normal distribution (p= 0.03<0.05), but the physical attitude post-test scores show normal distribution (p=0.200> 0.05). It is necessary to look at the skewness and kurtosis coefficients in order to show the normal distribution feature. The findings are summarized in Table 7.

Table 7. *Experimental and control group achievement and attitude posttest kurtosis and skewness coefficients*

		Stat.	Sh
Achievement post-test	Mean	56,55	2,914
	Media	62,50	
	Variance	356,693	
	Std. devieation	18,886	
	Minimum	20	
	Maximum	85	
	Ranj	65	
	Skewness	-,446	,365
	kurtosis	-,863	,717
Attitude Post-test	Mean	91,95	2,602
	Media	90,00	
	Variance	284,388	
	Std. devieation	16,864	
	Minimum	48	
	Maximum	148	
	Ranj	100	
	Skewness	,420	,365
	kurtosis	0,880	,717

Since the kurtosis and skewness coefficients of the achievement post-test scores in Table 7 are

between −1.5 and +1.5, it is assumed that they show normal distribution. In this direction, it was decided that parametric tests could be performed on the data. Before the experimental application, it was investigated whether the groups were equivalent in terms of academic achievement and attitudes towards physics, and it was summarized in Table 8.

Table 8. *Equivalence of experimental and control group students in terms of academic achievement and Attitude in Physics*

	Groups	N	X	Sd	df	t	p
Achievement Pre-test	Experimental	21	37,86	13,470	40	1,919	0,062
	Control	21	28,33	18,326			
Attitude Pre-test	Experimental	21	89,57	20,422	40	−0,191	0,850
	Control	21	90,71	18,374			
F1: Importance	Experimental	21	3,0333	,65141	40	−0,480	0,634
	Control	21	3,1524	,93092			
F2: Understanding	Experimental	21	2,7891	,80890	40	0,602	0,550
	Control	21	2,6531	,64614			
F3: Need	Experimental	21	3,2177	,76880	40	0,444	0,659
	Control	21	3,1088	,81804			
F4: Interest	Experimental	21	2,8651	,90618	40	−1,903	0,281
	Control	21	3,1429	,73084			

In Table 8, it is seen that the achievement pre-test average of the experimental group is higher than the achievement pre-test average of the control group. However, it can be said that this difference is not statistically significant ($t_{(2–40)}$= 1.919, p> 0.05). Accordingly, it can be said that the academic achievements of the experimental and control groups before the experimental process were equivalent to each other. Whether the difference between the experimental and control group attitude pre-test scores was significant was analyzed with the independent sample t test. It was not determined that there was no statistically significant difference in the pre-test attitude scores of the groups towards physics ($t_{(2–40)}$= −0.191, p> 0.05). It was determined that the sub-factor scores of importance, comprehension, need and interest in the attitude pretest did not differ between the groups ($t_{(2–40)}$= −0.480, p> 0.05; $t_{(2–40)}$= 0.602, p>0,). 05; $t_{(2–40)}$= 0.444, p> 0.05; $t_{(2–40)}$= −1.903, p> 0.05). Accordingly, it can be said that before the experimental process, the experimental and control groups were similar in terms of their attitudes towards physics. In this framework, the effectiveness of the experimental process was tested by performing a t-test on the post-test scores for the effectiveness of the experimental process.

FINDINGS

To conclude whether enriched book (e-book) supported teaching contributes significantly to the academic success of the students after the experimental process, it is necessary to examine whether there is a significant difference between the achievement post-test scores of the students in the experimental and control groups. For this, analysis was made with independent sample t test. The findings are summarized in Table 9.

Table 9. *Findings on the effect of e-book application on achievement*

	Groups	N	X	Sd	df	t	p
Achievement	Experimental	21	62,38	14,108	40	2,081	0,044
	Control	21	50,71	21,464			

According to Table 8, the achievement post-test average of the experimental group is higher than the average of the control group. It was determined that there was a significant difference in the success of the experimental and control groups at the end of the experimental process ($t_{(2–40)}$= 2.081, p<0.05). Accordingly, it can be said that enriched book-supported teaching contributes significantly more to the academic success of students. The findings regarding the effect of enriched book (e-book) supported instruction on students' attitudes towards Physics lesson are summarized in Table 10.

Table 10. *Findings on the effect of e-book application on attitude*

	Groups	N	X	Sd	df	t	p
Attitude	Experimental	21	89,38	9,646	40	−0,988	0,329
	Control	21	94,52	21,819			
F1: Importance	Experimental	21	3,0286	,35376	40	−0,814	0,420
	Control	21	3,2048	,92654			
F2: Understanding	Experimental	21	2,9388	,42755	40	−0,085	0,933
	Control	21	2,9524	,59818			
F3: Need	Experimental	21	2,9796	,59468	40	−1,112	0,273
	Control	21	3,2517	,95073			
F4: Interest	Experimental	21	2,9444	,56108	40	−1,116	0,271
	Control	21	3,1746	,76099			

According to the findings in Table 10, it was seen that the attitude post-test mean score of the control group was higher than the arithmetic mean of the experimental group. However, this difference does not appear to be statistically significant ($t_{(2–40)}$= −0.988, p> 0.05). When examined in terms of factors, it was determined that there was no statistical difference between the groups in the mean of the factors of importance, comprehension, need and interest ($t_{(2–40)}$= −0.814, p> 0.05; $t_{(2–40)}$= −0.085, p>0 .05; $t_{(2–40)}$=−1.112, p> 0.05; $t_{(2–40)}$= −1.116, p> 0.05). Accordingly, it can be said that the enriched teaching practice using Z-books does not have a significant contribution to the attitudes of the students towards the physics course.

DISCUSSION

As a result of the research, it was determined that e-book supported teaching contributed significantly more to the academic success of the students but did not differentiate their attitudes towards the physics course. In his study, Budiyar (2017) determined that the e-book application was statistically significant for students' attitudes towards mathematics but did not only contribute to the academic success and motivation of students. Vardar (2022) investigated the effects of the e-book used in distance education on students' academic achievement, attitudes towards the course and motivation. It was observed that there was a decrease in the post-test results applied to the experimental and control groups after the process, compared to the pre-test results, and it was concluded that the students' perspectives on technology were negatively affected after using e-books. In the same study, it was concluded that the use of e-books increased the academic achievement of the students. Şanal (2016) concluded in his study that the use of e-books has a positive effect on students' reading comprehension. Henawy and Mansur (2013) concluded in their study that students learn information more easily by enriching the content of e-books used in education. It is said that the lesson is more efficient thanks to the multimedia materials used in the e-book. In addition, in some studies, content analyzes of e-books were made. Ekici and Yılmaz (2013) listed in their study that there are deficiencies related to the development of the content of e-books and that these deficiencies are the lack of an update board, the lack of determination of the necessary deficiencies and the inability to express them with the achievements in the textbooks.

The effects of using smart board technology on academic achievement and attitude have also been examined in studies. Saraç (2020) investigated the effect of using smart boards on the academic achievement of 6th grade students. As a result, it was seen that the use of smart boards increased the academic success of the students. İşcan (2018) also investigated the effect of using smart boards in Physical Education and Sports lessons on students' attitudes. As a result of this research, there was a statistically positive difference in the attitudes of the students. In addition, it was thought that students' motivation towards learning increased and their academic success would increase with these results. In

a study conducted by Wall Higgins & Smith (2005), students' opinions were taken to determine the effectiveness of using smart boards in learning. Students said that the smart board had positive effects on learning, their interest in the lesson increased, and learning enriched with visuals made learning easier. In addition, in this study, students stated that their interest in the lesson decreased due to technical problems on the smart board. Kennewel (2006) states in his study that the use of smart boards in the application of different teaching methods and techniques increases the success of the students in the course, their interest in the course increases and what they learn is more permanent. Hakkari (2016) developed materials for the Chemistry course in his study and concluded that this material, which he applied, increased the academic success of the students. Kuş Serin (2015) stated that the enriched materials used by the students in the lesson have a positive effect on their learning, and their motivation towards the lesson has increased. Banoğlu, Madenoğlu, Uysal, and Dede (2014) stated in their study that teachers' content of e-books is not sufficient to be used in teaching, and that they need to be enriched with more digital materials. Kelley (2011) determined in his study that students who use e-books increase their reading comprehension levels.

In the study conducted by Dulda (2009), the experimental research method was used. He concluded that the experimental group was more successful in the pre-test and post-test results he applied to the two groups. In addition, he argued that the application of simulation and interactive whiteboard support in vocational courses in vocational high schools in schools with equipment and financial inadequacies will contribute to learning, albeit a little. Marshall and Ruotole (2002) used textbooks in e-book format in their studies. Students used these e-books on tablets in order to be easily accessible. The aim of this research is to determine whether the students read these contents from the tablets. In order to determine this, the students were interviewed, and it was concluded that the short texts were read more and the marking options on the text were used more.

Within the framework of these results, it can be recommended to apply e-book supported teaching on physics course unit subjects at all levels of secondary education. It can be said that the e-book, which will be used not only in the Physics course but also in other courses, can contribute to the academic success of the students.

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The Relationship Between Family Communications and School Adjustment Levels of Male Adolescents Aged 14-19

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Article Info	ABSTRACT
	This study was conducted to descriptive the relationship between family communication and school adjustment levels of male adolescents aged 14-19. This descriptive and correlational study was conducted. The sample of the study consisted of 347 male students. 80% of the universe has been reached. Data were collected using an information form, a family evaluation scale to measure their intra-family communication and a school adjustment scale to measure their school adjustment level. Data were collected from male students by face-to-face survey method. Data were summarized as mean, standard deviation, number, and percentage. T test, One Way ANOVA, Pearson Correlation test were used in the analyses. Obtained results were tested at $p<0.05$ significance level. 35.4% of the students were in the 10th and the mean age was 15.87 ± 1.18. It was determined that the communication skills of the families of 40.3% of the students were not functional, the Communication Sub-Dimensional score average was 1.94 ± 0.48 and the School Adjustment Scale average score was 23.49 ± 6.41. It was determined that there was a weak negative correlation ($r= -0.206$. $p<0.000$) between the Communication Sub-Dimension Scale and the School Adjustment Scale.In the study, a weak negative correlation was found between the family communication of adolescents and their level of school adjustment. It is recommended to intensify studies on this group in order to determine the factors that affect the school adjustment of adolescents aged 14-19, which corresponds to the high school age.

INTRODUCTION

Adolescence is a period beginning with puberty and ending with the end of body growth, and is a period of intense physical, social, mental and emotional developments. This is a period in which the individual questions his/her identity and begins to find himself/herself, and it can also be defined as a transition period from childhood to adulthood (Gökalp & Yöndem, 2021; Baysal et al., 2021). In adolescents between the ages of 14-19, as there are behaviours such as separation from parents, efforts to emotionally distance themselves from parents during the individuation process, focusing on peer relations (especially the opposite sex), underestimating risks and requiring autonomy cause conflicts with parents. Another situation that causes conflict is the communication disorder within the family (Güler, 2013; Elkin, 2016). It is possible only by establishing a positive communication network for family members to respond warmly and emotionally to each other, to show the necessary attention sincerely, and to solve the problems that arise within the family without harming the health of the family. Balanced, open and healthy communication within the family is effective in the development of the adolescent's identity and social skills (Savi, 2008; Küçük Biçer, 2014). Although the environment outside the family begins to affect the child as he/she grows up, the role of his/her family is very important for him/her to be an individual who can behave and adapt in accordance with the rules required by the environment he/she lives in (Kalyencioğlu & Kutlu 2010; Demirkalp Kaya, 2021). While children who grow up in families with good family relations and communication pass their developmental stages successfully, it is seen that children experience adaptation and behaviour problems in families where family relationships are not strong (Durmuşoğlu Saltalı, 2019; Demirkalp Kaya, 2021). The results of many studies in the literature have shown that family processes are determinative on adolescents' behaviours and adaptability (Kalyencioğlu & Kutlu, 2010; Ateş & Akbaş, 2012). While adolescents complete their social, emotional and cognitive development within the family in the first years of their lives, their socialization processes go beyond the family in later ages and continue rapidly in the axis of school environment and friend groups (Küçük Biçer, 2014).

School is known as the first socialization area outside the family (Kaya, 2014). In addition to the educational activities that the school provides as an educational institution, it also has important contributions to the social and emotional development of the individual with its network of relations (such as teacher-student, student-student). School adaptation is an important factor for the student to benefit from the educational, instructional and developmental contributions of the school at the maximum level (Ateş & Akbaş 2012; De la Barrera et al., 2019; Gökalp & Yöndem 2021). School adjustment is a structure involving active participation in school activities, compliance with rules and relationships with people in the school environment, and it is a multidimensional concept that includes the adaptive success and social behaviors of the student. (Yılmaz et al., 2017; Gutiérrez et al., 2021). Although students try to adapt to the different environments (school, teacher, friends, difficulty of studies, new rules, academic expectation, etc.) in all educational transitions such as preschool, primary school, secondary school, high school and university; the periods between the ages of 14-19, which coincide with high school years, are one of the most difficult times that requires adaptation. It is important for students to have healthy transition periods in order to avoid risky behaviours, fulfill their academic responsibilities, and continue their education process successfully and happily (Kalyencioğlu & Kutlu 2010; Adimora et al., 2015; Demirkalp Kaya, 2021). As a matter of fact, studies show that adaptability in educational transitions has an effect on mental health and academic success (Özen Altınkaynak & Akman 2019; Noona Kiuru et al., 2020; Demirkalp Kaya, 2021). Going through this process in a healthy way depends on being in harmony with their environment and establishing good relations. Because people have to adapt to themselves and their environment in order to make their lives easier and realize themselves (Aydoğdu & Gürsoy 2020). Considering that the socialization process of the individual starts in the family and the risks that the adolescence period involves in terms of relations with the family, it is thought that parent-child relationships may have an important place in the school adjustment process of adolescents (Ateş & Akbaş 2012; Koç, 2014). In addition, Dockett and Perry

290

(2003) found in their research that there are eight different situations that affect the adaptation process of the individual to school, and family problems are the leading of these situations (Akt. Demirci, 2019). In many academic studies, important findings were determined by examining adolescents' school adaptation processes and their communication with their families. Coe et al. (2018) showed in a study that children's negative internal representations of family relationships mediate the relationships between family instability and school adjustment problems. In a study conducted by Kaya (2021), it was determined that positive family relations significantly predict secondary school students' school adjustment in a positive way. When the national and international literature is examined, it has been understood in many other studies that family-related factors are determinant on school adjustment (Arabacıoğlu & Kahraman 2021; Hershberger & Jones 2018; Özen Altınkaynak & Akman 2018; Türker & Tunç; 2021; Wu et al., 2021; Yılmaz et al., 2017). Therefore, it can be said that the family, which is the first place of development of the individual, and the communication of individuals within the family with each other are important in the process of adaptation to school. When the studies in Turkey are examined, it is seen that the subject of school adjustment is especially concentrated at the pre-school, primary and secondary school levels (Altınkaynak & Akman 2018; Gülay, 2011; Bulut 2019; Dinler & Hacıfazlıoğlu 2020; Arabacıoğlu & Kahraman 2021; Türker & Tunç 2021; Usta et al., 2021), and that school adjustment is limited in adolescents between the ages of 14-19, which coincides with the high school period (Dağ, 2018; Çetinkaya et al., 2019). The results of the study show that especially male students have more adaptation and behaviour problems. Therefore, this study was conducted as a relationship seeker in order to determine the relationship between the family communication and school adjustment levels of male adolescents between the ages of 14-19. The search sought answers to the following questions:

• What is the family communication of male adolescents between the ages of 14-19?

• What is the school adjustment level of male adolescents aged 14-19?

• Is there a relationship between the family communication and school adjustment levels of male adolescents aged 14-19?

METHOD

Type of Research

The research was conducted as descriptive and correlational.

Location and Features of the Research

The research was carried out at a male anatolian imam hatip high school, which is affiliated to the Ministry of National Education (MEB), and it is located in the city center of Konya. This high school started its educational activities in 2016. A total of 434 male students are being educated in the building, which consists of a single block, and there are currently no female students. The school has a total of 19 classes, four of which are grade 9, five grade 10, six grade 11, and four grade 12. The joint Anatolian Imam Hatip High School curriculum is being followed in the 9th grades, and students are divided into special areas in the 10th, 11th and 12th grades. The school, which has three floors, has a teachers' room, a conference hall, a library, a canteen, a health room, a prayer room and a software workshop. It also has a large garden, and offers a game room where students can spend their free time (table tennis, chess, foosball) and a sports field where they can do sports activities.

The Universe of the Research

The universe of the research consists of 434 students attending at a male anatolian imam hatip high school in the city center of Konya, affiliated to the Ministry of National Education, in the 2021-2022 academic year.

Sample of the Study

No sample was chosen from the universe and the entire population was accepted as a sample. The sample consists of 347 male students and 80% of the universe was reached.

Inclusion Criteria for Participants in the Study

Students who received written consent from their parents and agreed to participate in the study were included in the study.

Exclusion Criteria for Participants in the Study

Foreign students were not included in the study in order not to experience Turkish communication problems and to carry out the study with a homogeneous group.

Data Collection Technique and Tools

The data were collected in the form of a face-to-face survey. The Personal Information Form to describe the personal characteristics of the students, the Communication Sub-Dimension of the Family Assessment Device adapted to Turkish by Bulut (1990) to measure the family communication of the students, and the School Cohesion Scale adapted into Turkish by Durnalı et al. (2018) were used.

Personal Information Form: At the entrance of the form created by the researcher as a result of literature review, a brief information about the research and why the data was collected were given. The form contains 11 questions to describe features such as personal factors like age, grade level, reason for choosing high school, academic success, coexistence of parents, education level of mother and father, occupation of mother and father, how many siblings they have, whether they have any health problems in themselves or in the family, and perceived income status (Arabacıoğlu & Kahraman 2021; Hershberger & Jones 2018; Özen Altınkaynak & Akman 2018; Türker & Tunç; 2021; Wu et al., 2021; Yılmaz et al., 2017).

Family Assessment Device (FAD): Developed by Epstein et al. (1983) and adapted into Turkish by Bulut (1990), it measures family functions with its healthy and unhealthy dimensions. The scale, which has 7 sub-dimensions including problem solving, communication, roles, emotional responsiveness, emotional participation, behaviour control, and general functions, consists of 60 items. It is a four-point Likert-type scale involving statements such as "I strongly agree", "I agree", "I somewhat agree", "I do not agree at all" and is scored between 1 (healthiest) and 4 (unhealthiest). Bulut (1990) determined the score of 2 as distinctive and the scores above 2 are determined as an indicator of poor health in family functions. In this study, the communication sub-dimension of the scale, which evaluates communication between family members, was used. The sub-dimension of communication consists of nine items and the Cronbach alpha internal consistency coefficient calculated for this sub-dimension is .71 (Bulut, 1990). The scores that can be obtained from the communication dimension range from 9 to 36.

School Cohesion Scale (SCS): Turkish version of SCS, developed by Springer et al. (2009) in order to determine the school adjustment level of adolescents, was adapted by Durnalı et al. (2018). It is a 4-point Likert-type scale that includes statements such as 1. I never think, 2. I sometimes think, 3. I often think, 4. I always think. It consists of a total of … items and the lowest score that can be obtained from the scale is 10, and the highest score is 50. A high score from the scale, which does not have a reverse-scored item, indicates high school adjustment, and a low score indicates low school adjustment.

Data Collection

The Parent Consent Form was delivered to the parents through the students the day before. The data was collected face-to-face by the researcher by distributing data collection tools to the students, whose parents gave written consent. It was collected during the course hours deemed appropriate by the school administration covering a maximum of one course hour. In the reliability study of the scale, the

Cronbach alpha internal consistency coefficient was found to be .84 (Durnalı et al., 2018).

Variables of the Study

Dependent variables: SCS Score

Independent variables:

• Descriptive Features

• FAD communication sub-dimension score

Ethical Dimension of Research

Written permission for the research was obtained from the Necmettin Erbakan University Health Sciences Scientific Research Ethics Committee (decision dated 02.03.2022 and numbered 2022/20-175). Necessary permissions were obtained from the authors of the scales used in the study via e-mail. An interview was held with the school administration of the school and necessary information was provided. Written consent form was sent to the families one day before the questionnaire forms were distributed, and verbal consent was obtained for volunteering to participate in the study by giving information about the study to the students whose written consent was obtained from the families.

Limitations of the Research

The research is limited to the male students in the high school where the data was collected.

Statistical Evaluation of Data

In line with the general purpose of the research, the data collected from the Personal Information Form, the FAD intra-familial communication sub-dimension and the SCS for the basic questions were analyzed in a computer environment by using the SPSS program. In the evaluation of the data and in order to determine the validity and reliability of the scales, frequency, percentage, arithmetic mean, standard deviation and Pearson correlation test were used. The results were tested at $p<0.05$ significance level. In the study, the relationship between the variables was interpreted as .00-.19 very weak relationship, 0.20-0.39 weak relationship, 0.40-0.69 moderate relationship, 0.70-0.89 high level relationship, and 0.90-1.00 very high relationship.Write down the method of your research without changing the format. Write down the method of your research without changing the format. Write down the method of your research without changing the format.

Çalışmanızın yöntemi ile ilgili bilgileri biçimlendirmeyi bozmadan yazınız. Çalışmanızın yöntemi ile ilgili bilgileri biçimlendirmeyi bozmadan yazınız.

RESULTS

In this part of the study, the results of the statistical analysis carried out within the scope of this research will be included. First of all, descriptive data regarding the definition of the research sample are presented in Table 1.Write the findings about your work without disrupting the formatting. Write the findings about your work without disrupting the formatting. Write the findings about your work without disrupting the formatting.

Table 1. *Data distribution by demographic features*

Socio-demographic characteristics	Number (n)	Percent (%)
Class		
9th Class	111	32.0
10th Class	123	35.4
11th Class	85	24.5
12th Class	28	8.1
Choice of high school		
My own decision	227	65.4

My parents' decision	103	29.7
My reachers' wish	16	4.6
My friends' wish	1	0.3
Your grade score average in previous semester		
Under 50	2	0.6
Between 50-60	34	9.8
Between 60-70	73	21.0
Between 70-80	92	26.5
80 and above	146	42.1
Presence of mental/physical illness		
Yes	32	9.2
No	315	90.8
Cohabitation status of parents		
Yes	334	96.3
No	13	3.7
Mother's education level		
Primary school	129	37.2
Middle School	70	20.2
High school	78	22.5
University and above	70	20.2
Father's education level		
Primary school	62	17.9
Middle School	51	14.7
High school	107	30.8
University and above	127	36.6
Family's Monthly Income Level		
Income less than expenses	39	11.2
Income equals expense	177	51.0
Income more than expenses	131	37.8
Mother's occupation		
Housewife	304	87.6
Labourer	17	4.9
Official	26	7.5
Father's occupation		
Not working	17	4.9
Employee	164	47.3
Official	9	2.6
Farmer	97	28.0
Other (own business, tradesman, contractor)	60	17.3
Number of siblings		
1	11	3.2
2	88	25.4
3	161	46.4
4	67	19.3
5	20	5.8
Age	Mean±SD: 15.87±1.18 Median:16	Min-Max:14-18

When Table 1 is examined, it is seen that 32% of the students are in the ninth, 35.4% in the tenth, 324.5% in the eleventh and 8.1% in the twelfth grade. The mean age of the adolescents is 15.87 (±1.18). The choice of high school was determined by the wishes of 65.4% of the students, the wishes of their families in 29.7%, and the wishes of their friends or teachers in 4.9%. 42.1% of them had a grade point average of 80 and above in the previous semester. 9.2% have a physical or mental illness. Parents of

96.3% are married and together. The mothers of 37.22% are primary school graduates, and the fathers of 36.6% are university graduates. The income of 51% is equal to their expenses. The mothers of 87.6% are housewives and the fathers of 47.3% are employee, 46.4% of them have 3 siblings.

In Table 2, information on the FAD intra-familial communication sub-dimension and the mean scores of the School Cohesion Scale, standard deviations and the minimum-maximum scores obtained from the scales of the adolescents participating in the research are presented.Only the first letter of the table number and table name must be capitalized. The table number should be bold and the table text should normally be written above the table and left aligned. No text should be written to the left or right of the tables.

Table 2. *FAD communication sub-dimension and SCS score averages, standard deviation and min-max values*

	Mean (SD)	Min	Max
FAD communication sub-dimension	1.94±0.48	1.00	3.78
SCS	23.49±6.41	10.00	40.00

The participants' FAD communication sub-dimension score mean was determined as 1.94±0.48. Considering the criterion of accepting healthy communication as below 2 points determined by Bulut (1990), it can be said that most of the adolescents participating in the research have a healthy communication with their families. The mean score of the adolescents' School Cohesion Scale was determined as 23.49±6.41 (Table 2). Considering the minimum and maximum scores that can be obtained from the scale (10-40), it can be said that the school adjustment of the adolescents is moderate.

In Table 3, the comparison results of the level of adjustment to school according to the healthy/unhealthy communication status of the adolescents with their families are presented.

Table 3. Comparison of school adjustment levels according to family communication status

	n (%)	Mean±SD	t value	Significance level
Healthy communication	207 (59.7)	24.15±6.39		
Unhealthy communication	140 (40.3)	22.50±6.34	t=2.36	p=0.018

When Table 3 is examined, it is seen that the school adjustment scores of the students who have healthy communication within the family are statistically significantly higher than their peers who have unhealthy communication with their families (t=2.36; p<0,05).

Table 4 presents the statistical analysis results of the relationship between adolescents' family communication and school adjustment.

Table 4. *The relationship between family communication and school adjustment (n=347)*

	School adjustment
Family communication	-.206[**]

**p<0.01

When Table 4 is examined, it is found that there is a statistically significant negative correlation (r= -0.206. p<0.01) between the adolescents' family communication scores and school adjustment scores. The detected relationship is weak due to its r value between .20 and .39.

DISCUSSION

The adolescence period, where growth, development and change is very rapid, brings many new roles and problems for individuals. Social environment is important for a healthy adolescent period. The components of the social environment provide support for the growth, development and change of adolescents. Social environment components include school, family, health services and external factors. The functionality of the family, which is known as the most effective social structure, is effective on adolescents' behaviours and adjustment levels (Kulaksızoğlu, 2011). In this study, adolescents' FAD communication sub-dimension mean score was determined as 1.94±0.48, and it was found that 40.3% of the students perceived their families' communication skills as unhealthy. The results are consistent with the literature (Karaağaç & Erbay, 2015). The forms of communication established with adolescents enable them to express their feelings and thoughts and to form future-oriented behaviours (Elkin, 2016). Therefore, establishing functional communication within the family is important for adolescents. The communication models used according to the systems approach direct the interactions of individuals within the family. Families are defined as healthy and unhealthy families according to their communication functions within the family. Inability to fulfill communication functions in families defined as unhealthy families causes stress and conflicts (Bulut, 1990). On the contrary, it is stated that the supportive relationships of parents towards adolescents increase school welfare and academic success (Kiuru et al., 2020). It is considered important to organize remedial programs by school management, teachers, psychiatric nurses, school health nurses and psychologists for adolescents' intra-family communication.

As a result of the research, it was determined that the students' SCS score average was 23.49±6.41. Considering the min-max values of the score obtained from the scale, this score was interpreted as the students' adaptation to the school at a moderate level. In a longitudinal study conducted in Korea, it was determined that the school adjustment level of students from 7th to 11th grade was moderate, similar to our study (In, 2022). Adapting to a new environment involves varying degrees of difficulty in all age groups and developmental stages. Especially, adaptation to school can be difficult for young people (Akhan & Karamık, 2019). High school adjustment enables children to develop in many areas such as mental health, personality development, and academic success. It is also important for the adolescent to express himself better, gain strength and motivation (Pathak, 2022). Since adaptation to school may also affect adaptation to society, necessary measures should be taken in order for children to adapt to the education system (Kaya & Akgün 2016). It is thought that the psychological empowerment of students and the inclusion of activities in the curriculum by people who are competent in the field of mental health in schools will contribute to increasing the level of adaptation.

In the study, it was determined that there is a weak negative correlation (r= -0.206. p<0.01) between FAD communication sub-dimension scores and SCS scores. In a previous study in the literature, it was determined that the most important factor affecting the level of school adjustment is the family after teachers (Fernández et al., 2021). This result supports our study as well. Students who perceive their family functions as unhealthy experience adaptation problems in many subjects, including school (Kalyencioğlu & Kutlu 2010). Family conflicts and the level of aggression in adolescents negatively affect the level of school adjustment (Lee, 2020). Basharpor and Heidari (2022) reported that adaptive and supportive family systems have a direct effect on school adjustment levels. Mok et al. (2019) determined in their study that positive parenting behaviours of the mother will help improve adolescents' school adjustment by increasing the level of ego-resilience. It is seen in the studies that the functional and compatible families have an effect on the level of school adjustment.

CONCLUSION AND RECOMMENDATIONS

In the study, a weak negative relationship was found between the family communication of adolescents and their level of school adjustment. Considering that adolescents go through complex processes in their developmental period, both in-school and out-of-school environments can affect their adaptation to school. It is recommended to intensify studies on this group in order to determine the factors that affect the school adjustment of adolescents between the ages of 14-19, which corresponds to the high school age. Future studies should also focus on other factors such as teachers, peers, and school management that determine adolescents' school adjustment.

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The Opinions of Teachers about School Principals who graduated from Physical Education and Sports Departments

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Article Info	ABSTRACT
	The aim of this research is to determine the opinions of teachers about school principals who graduated from physical education and sports departments. This research was designed as a qualitative research. The study group of this research consists of 10 teachers whose school principals graduated from physical education and sports in Erzurum in the 2022-2023 academic year. In this study, maximum variation sampling, one of the purposive sampling methods, was used. As a result of this, teachers revealed two main themes and ten sub-themes. The first theme is individual behaviors of school principals. The sub-themes of individual behaviors of school principals are communication, inability to manage instructional program, motivation, sport activity and authority respectively. The second theme is the behaviors of the school principals about the school culture. The sub-themes of the behaviors of the school principals about the school culture are ceremonies, organizational communication, values, role models and rewards in the school culture respectively.

INTRODUCTION

People are facing many problems. People need leaders who will solve these problems and manage change. However, there is no leadership behavior or characteristic that always gives the same result in different cultures, different sectors and different organizations (Barutçugil, 2014). Efforts to identify the best leadership trait set and leadership behaviors have some limitations. It is a common view that effective leadership behavior is situational today (Lunenburg, & Ornstein, 2021). We believe that the personality traits of the leader and their educational background are important, as there are no universal common behaviors related to leadership. That's why, it's important to know the definition of leadership and distinguishes it from other similar things.

There are many definitions of leadership and definitions related to leadership have common points. The first is a specific purpose, the second is a specific group of people, and the third is a leader to direct them (Zel, 2011). Robbins & Judge (2009) defines it as influencing a group to achieve vision and goals. Yulk (1981) defines it as influencing group members. Conlow (1999) defines it as an influence function. In the light of these, leadership has three important dimensions. The first of these requires leadership influence. Second, leadership requires reaching the goal. Third, leadership requires followers (Lunenburg, & Ornstein, 2021). Leaders influence their followers and organizations to achieve the goal.

One of the important antecedents of leadership behavior is the personal characteristics and qualities of leaders (Hoy & Miskel, 2010). Leaders have a positive effect on school culture and employees with the characteristics they have (Kalkan, Aksal & Dağlı, 2020; Stolp, 1994). In case of discovering the beliefs and assumptions that are elements of culture, managaer can achieve performance (Şişman, 2007). Effective and trust-based school cultures have a positive effect on student achievement. On the other hand, school cultures based on humane control support the social aspects of students (Hoy & Miskel, 2010). In summary, school administrators have a significant impact on students' achievements, teachers, and the culture of their school. In Turkey, teachers can become school administrators. In order to understand the contributions that physical education and sports teachers make to their institutions after becoming a school administrator, we first want to understand the qualities of a physical education and sports.

In the literature, opinions about the qualifications, which physical education and sports teachers should have, can be diversified according to the opinions of students, teachers and academicians. Some of them are professional knowledge and skills, self-control, appearance, understanding, perfect relations, open to criticism, patience, sense of humor, self-confidence, interest in the lesson and students, objectivity, discipline, open to student opinions and criticism, improvisation, using rewards, student participation, teaching according to student level (Demirhan, Coşkun& Altay, 2002; Saçlı, Bulca, Demirhan, & Kangalgil, 2009).

There are many reasons why physical education and sports teachers become school administrators. When we consider their personality traits, physical education and sports teachers think that they have good leadership and management skills. They want to choose management because of the higher positions and better working conditions. In addition, physical education teachers have revealed that they have a chance to gain a social environment, too. Appreciation is also an important factor for physical education and sports teachers to be managers. Finally, it is a very important factor for physical education and sports managers to think that they will contribute to their profession (Esentürk, & Güngör, 2019).

In the literature, there are limited researches on the contributions of physical education and sports teachers to schools as administrators. In this context, this research will make an important contribution to the literature. This provides the awareness of education administrators about the positive behaviors of physical education and sports graduate school administrators. The aim of this research is to determine

the opinions of teachers about school principals who graduated from physical education and sports departments. In order to achieve this general purpose, the participants were asked 1) the views of the teachers about the individual behaviors of the school principals who graduated from physical education and sports 2) the opinions of the teachers about the school culture of the school principals who were graduated from physical education and sports.

METHOD

Research Design

This research is to determine the opinions of teachers about school principals who graduated from physical education and sports departments. This study will not generalize from the opinions of teachers. Instead, this research will examine the teachers' views on school principals who are graduates of physical education and sports departments. Therefore, this research was designed as a qualitative research. There are in-depth descriptions and interpretations in this research (Yıldırım & Şimşek, 2013). In addition, this research was designed with a case study. Case study is the in-depth study of a particular situation in a period of time (Creswell, 2013).

Study Group

The study group of this research consists of 10 teachers whose school principals graduated from physical education and sports in Erzurum in the 2022-2023 academic years. The number of participants included in the research stopped when the themes and sub-bases repeated each other (Creswell, 2013). In this study, maximum variation sampling, one of the purposive sampling methods, was used. Maximum variation sampling is not to generalize but rather to reveal what is the same and different among diverse situations (Yıldırım & Şimşek, 2013). 6 of the participants are female and 4 are male. These teachers participated in the research from 5 different schools. Teachers were coded according to the first letter of their school's type. The teachers participating in the research were coded as A1, A2, C1, C2, S1, S2, V1, V2, V3 and E1. In other words, there are two teachers from school A, two teachers from school C, two teachers from school S, three teachers from school V, three teachers from school E, and one teacher from school E. The average age of the participants is 36,9.

Research Instruments and Processes

This research is to determine the opinions of teachers about school principals who graduated from physical education and sports departments. There are two questions in this research. Semi-structured interview form was used because these questions were related to how teachers perceived their principals. Individual responses are collected from each participant. Although there are no pre-determined statements and questions, there are questions to be clarified in the semi-structured interview form (Merriam, 2013). The questions in the semi-structured interview form were obtained as a result of literature review. One language and two experts evaluated the questions. As a result, the contents of the questions were changed twice. Afterwards, a teacher was interviewed in the context of the pilot application.

Data Analysis

The teachers were interviewed between on October 6 and October 28, 2022. The interview time with a teacher was approximately 35 minutes. Before the interview, the teachers were selected when they were available, and questions were asked face-to-face or by phone. During the interview, the opinions of the participants were noted. After the meeting was over, the participants confirmed the notes taken. During this

research, validity and reliability were ensured by obtaining participant confirmation, expert opinion, recording the notes taken during the interview, and establishing long-term interaction with the participants (Creswell, 2013; Yıldırım & Şimşek, 2013).

The main purpose of content analysis is to explain the concepts, organize the concepts and reveal the themes. With content analysis, the facts in the data are revealed. The main purpose is to bring same concepts and organize them for the reader. First, the data is encoded. Second, themes are revealed. Thirdly, the arrangement of codes and themes are revealed. Fourth, the findings are identified and interpreted (Yıldırım & Şimşek, 2013). Data has been transferred to Nvivo program to make content analysis easier. With this software, themes and sub-themes can be interpreted using quantitative data (Bilgin, 2006; Creswell, 2013). The number of citations received by the codes and themes made with the Nvivo program is shown by the thickness of the relevant arrows. The thickness of the number of arrows leading to a theme or sub-theme is at most 5k. On the other hand, the arrow thickness leading to the least cited theme or sub-theme is 1k.

FINDINGS

The figure showing the main and sub-themes that emerged as a result of the research is presented below. In addition to this, there are sentences that are examples for this theme and sub-themes.
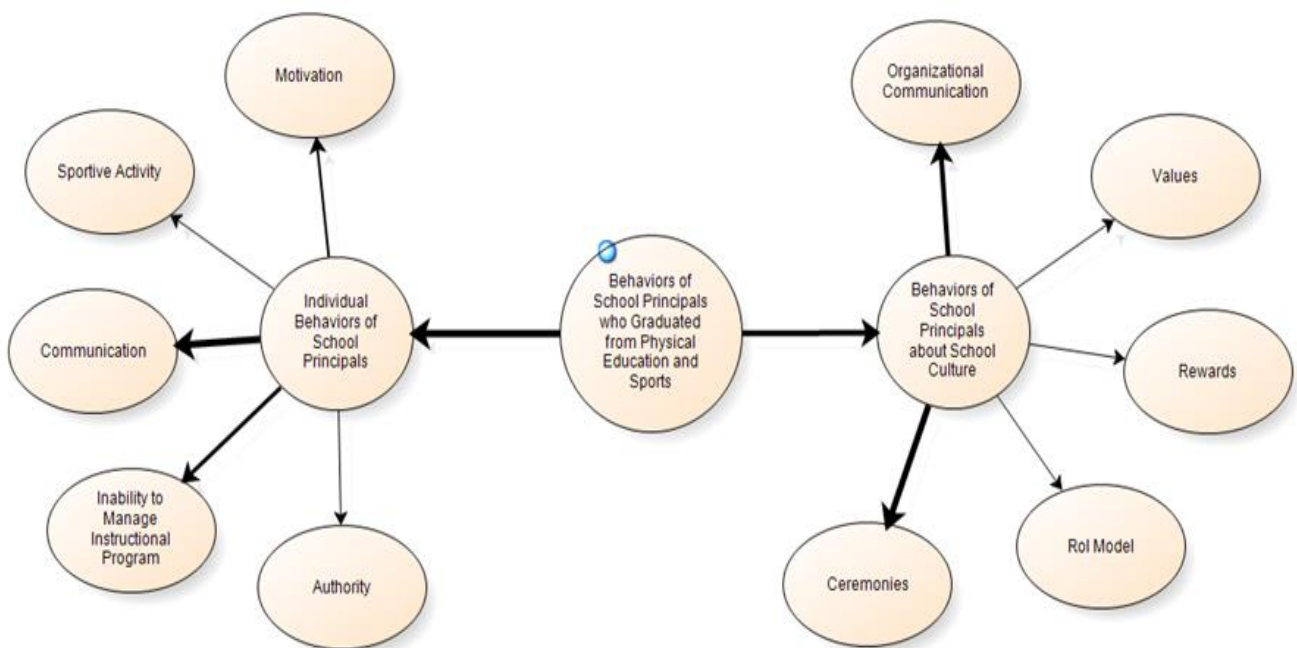
Figure 1. *A Shematic Display of The Motivation For Behaviors of The School Principals Who Graduated from Physical Education and Sports*

The Individual Behaviors of the School Principals

In this research, 'individual behaviors of school principals' is the first theme. Teachers expressed their views on the individual behaviors of school principals who graduated from physical education and sports. The sub-themes consisting of the opinions of teachers who are physical education and sports graduate school principals about 'individual behaviors of school principals' are listed below from the most cited sub-theme to the least cited sub-theme.

Communication

According to the findings obtained as a result of the research, the most cited view within the theme of 'individual behaviors of school principals' is 'communication'. In other words, school

principals who are graduates of physical education and sports can communicate effectively. The sentences that are examples of this sub-theme are below.

"…our principal is a person who does not break people's hearts. He always establishes warm relations with us… (V1)"

"… I think school administrators who are physical education and sports graduates are more extroverted. They spend time with teachers. They can respond to problems and needs more quickly … (S2)"

… compared to the previous school principal, this principal is a very good person when she compares them both as a communicator and as a human being… (C1)

Inability to Manage Instructional Program

According to the findings obtained as a result of the research, the second view within the theme of 'individual behaviors of school principals' is 'inability to manage instructional program'. According to the opinions of teachers, school principals who graduated from physical education do not have the necessary knowledge to be successful in the content of the courses such as mathematics, physics or English. That is, it cannot be said that they are academically successful. The sentences that are examples of this sub-theme are below.

"… I think that this manager is not knowledgeable about academic success because he is interested in the abilities of students in physical education and sports lessons. I can say that he sees academic success as a 'race' … (C2)"

"… they are different in vision. Physical education cannot solve academic problems as a teacher …(V2)

Motivation

According to the findings obtained as a result of the research, the third view within the theme of 'individual behaviors of school principals' is 'motivation'. School principals who are graduates of physical education and sports can motivate teachers. The sentence that is examples of this sub-theme is below.

"…this manager contributed positively to the increase perception of ethics and respect for the profession…(A1)

Sportive Activity

According to the findings obtained as a result of the research, the fourth view within the theme of 'individual behaviors of school principals' is 'sports activity'. School principals who are graduates of physical education and sports can organize more sports and social events for students and teachers. The sentence that is examples of this sub-theme is below.

"...in general, there is not much difference, but this manager gives more importance to sports and extracurricular activities. This manager encourages students to do sports and participate in competitions more ... (E1)

Authority

According to the findings obtained as a result of the research, the fifth view within the theme of 'individual behaviors of school principals' is 'authority'. School principals who are graduates of physical education and sports can provide control and discipline. The sentence that is examples of this sub-theme is below.

"… This principal is disciplined. But he is not a tough person in personality, but the principals is constantly controlling. The principals controls directly and indirectly...(V1)

The Behaviors of the School Principals about The School Culture

In this research, 'culture' is the second theme. Teachers stated the contributions of school principals who are graduates of physical education and sports to the culture of the school. The sub-themes consisting of the opinions of teachers, physical education and sports graduate school principals about the culture of the school are listed below from the most cited sub-theme to the least cited sub-theme.

Ceremonies

According to the findings obtained as a result of the research, the most cited view within the theme of 'culture' is 'ceremonies'. In other words, school principals who are graduates of physical education and sports strengthen the school culture through ceremonies. The sentences that are examples of this sub-theme are below.

"… he planned ice skating and breakfast to reduce the exam anxiety of 12th grade students and to keep relationships with people at school strong… (A2)"

"… our school principal participates in all activities such as ceremonies and organizations. School is more social. For example, compared to our old school, this school is more social and active.…(V3)

"… this school principal tried to create environmental consciousness through activities.… (S2)"

Organizational Communication

According to the findings obtained as a result of the research, the second view within the theme of 'culture' is 'organizational communication'. When we compare with other school principals, school principals graduated from physical education and sports could be successful in providing interaction in their schools. The sentences that are examples of this sub-theme are below.

"… we can communicate better with this principal. Students can express themselves more easily.… (E1)"

"… communicates with other teachers and students.…(S1)

Values

According to the findings obtained as a result of the research, the third view within the theme of 'culture' is 'values'. School principals who are graduates of physical education and sports can create a positive set of values in their schools. The sentence that is examples of this sub-theme is below.

"… this principal tries to teach students about national and target values and feelings. Our school principal is always supportive of our teacher friends...…(S2)

Rol Model

According to the findings obtained as a result of the research, the fourth view within the theme of 'culture' is 'rol model'. School principals who are graduates of physical education and sports can be rol model for teachers and students. The sentence that is examples of this sub-theme is below.

"… our school principal shows teachers as a role model...(A1)

Rewards

According to the findings obtained as a result of the research, the fifth view within the theme of 'culture' is 'rewards'. School principals who are graduates of physical education and sports use rewards as motivator as a part of school culture. The sentence that is examples of this sub-theme is below.

"… our previous manager did not even congratulate us when we became champions. However, our current school principal gave material and moral support....(C1)

DISCUSSION, CONCLUSION, RECOMMENDATIONS

The aim of this study is to find out the opinions of teachers about school principals who graduated from physical education and sports departments. Therefore, teachers were asked about the individual attitudes of school principals towards teachers and their contributions to the culture of their schools. As a result, opinions on two main themes and ten sub-themes were obtained. In other words, the teachers revealed that the school principals who graduated from physical education and sports have different qualifications than the school principals who graduated from other departments in their schools. While making this comparison, the teachers were asked to compare the school principals who graduated from physical education and sports with their previous school principals.

The first theme is individual behaviors of school principals. The sub-themes of individual behaviors of school principals are communication, inability to manage instructional program, motivation, sport activity and authority respectively. The first of these sub-themes is communication. In other words, school principals who are graduates of physical education and sports can communicate effectively. Demirtaş & Özer (2014) stated that before starting their duties, school administrators should focus on leadership, motivation, coping with stress, communication, conflict management, meeting management. Elekoğlu & Demirdağ (2020) stated that a positive and significant relationship was found between the skills of school principals and their communication skills. Aslanargun& Bozkurt (2012) revealed that one of the problems faced by school principals in school management is the lack of communication.

The second sub-theme is 'inability to manage instructional program'. School principals who graduated from physical education do not have the necessary knowledge to be successful in the content of the courses. Hallinger (2010) stated that as instructional leaders, school principals should play an important role in the coordination of the curriculum and instructional program in their schools. Stiggins & Duke (2008) stated that school principals should consider results from student assessments. Using these results, the school principal should reevaluate the education curriculum. In this context, the principal of the school should assist the school teachers.

The third sub-theme is motivation. School principals who are graduates of physical education and sports can motivate teachers. Unlike this research, Özdemir, Kartal & Yirci (2014) shows that the performance of school principals, who have an important place in teacher motivation, is below the expected level at this point. In his research, Ada, Akan, Ayık, Yıldırım & Yalçın (2013) revealed that external factors rather than internal factors are effective in the motivation of teachers. In order to motivate teachers, a strong administrator support is needed. Yıldırım (2011) revealed that school

principals are motivated by appreciation.

The other two sub-themes of the culture theme are sport acvitiy and authority. School principals who are graduates of physical education and sports can organize more sports and social events for students and teachers. School principals who are graduates of physical education and sports can provide control and discipline. In her research, Diş & Akbaşlı (2019) revealed that leader school administrators should be the ones who organize supportive social-artistic and sports activities related to social activity activities. In his qualitative research, Yirci & Berk (2021) revealed the qualities that school principals should have. One of the findings of the study is that school principals are authoritarian in accordance with the situation.

The second theme is the behaviors of the school principals regarding the school culture. The sub-themes of the behaviors of the school principals regarding the school culture are ceremonies, organizational communication, values, role models and rewards in the school culture respectively. The first of these sub-themes is ceremonies. In other words, school principals who are graduates of physical education and sports strengthen the school culture through ceremonies. This is the most referenced view by teachers. This finding has been supported by other researches. Aslan, Özer & Bakır (2009) Aslan, Özer & Bakır (2009) emphasized in their research that administrators and teachers should hold school-related ceremonies. However, it was stated that this and similar ceremonies could not be held due to reasons such as the large number of participants, economic inadequacy and lack of places. Şahin (2013) emphasized that school administrators should convey their values. One of the best way to transfer these values is ceremonies. In summary, ceremonies are one of the important elements for effective schools. Examples of ceremonies held at school are social events such as theatre, sportive tournaments, national celebrations, specific days and weeks, flag ceremonies, achievement awards, year-end events and year-end graduation ceremonies. Peterson & Deal (2011) stated that ceremonies shape cultural values. It also creates close relationships among people. Ceremonies are events that provide support to people. Thanks to the ceremonies, the contributions of the all people can be appreciated.

The second sub-theme is organizational communication. In fact, school principals graduated from physical education and sports could be successful in providing interaction in their schools. This finding has been supported by other research. Gürbüz, Erdem, & Yıldırım. (2013) emphasized school principals' success is to use humor, ensure that their employees have job satisfaction, communicate effectively, use their authority appropriately. Ayık & Fidan (2014) emphasized communication skills of school administrators should be improved. The presence of a high level of covert communication also triggers a strong school culture. Therefore, school administrators should have knowledge about organizational communication. Unlike this research, Çınar (2010) revealed that although administrators are effective in communication, school administrators' communication skills were not at a high level. In other words, it was revealed that the integration of school administrators with the environment was at a moderate level.

The third sub-theme is value. In other word, school principals who are graduates of physical education and sports can create a positive set of values in their schools. Çelikten (2003) revealed that school principals perceive school culture more positively than teachers. Demirtaş & Ekmekyapar (2012) revealed that the values of the administrators and the values-based management practices are important in increasing the work efficiency between them and the teachers, in motivating the teachers and in the perception that the teachers are respected. It is important for school administrators to develop individual and organizational value. Taş & Yeşiltaş (2016) the main values that give priority to the life of school principals are honesty, love, respect, justice, tolerance, and helpfulness. Most of the school principals stated that the school has a great effect on the value acquisition and that the school is the most effective factor after the family.

The other two sub-themes of the culture theme are role model and reward. School principals who

are graduates of physical education and sports can be rol model for teachers and students. School principals who are graduates of physical education and sports also use rewards as motivator as a part of school culture. Özsoy (2011) stated that there is not pozitive relationship between the perceptions of the administrators and teachers' role model behaviors and the problematic behavior attitudes of the students. She students who perceived the role model behaviors of the administrators and teachers positively are not student who has problematic behavior attitudes. Kaygı (2020) revealed that although the reward power is a motivating factor, it is not used much. Rewards should not be given privately to individuals. On the contrary, awards should be given according to high performance and success criteria.

According to these results of the research, it was revealed that the ability to communicate in the managerial qualities of physical education and sports graduate school principals is dominant for both personal and school culture. Therefore, school administrators should establish positive communication with teachers. It has been revealed that school principals graduated from physical education and sports cannot coordinate the instructional curriculum of the school. Therefore, it is recommended that these school principals can carry out more research on the school curriculum and courses and improve themselves.

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The Effect of Strong and Weak Unidimensional Item Pools on Computerized Adaptive Classification Testing

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Article Info	ABSTRACT

Computerized Adaptive Classification Tests (CACT) aim to classify individuals effectively with high classification accuracy and few items over large item pools. The characteristic features of the item pool include the number of items, item factor loadings, the distribution of the Test Information Function, and dimensionality. In this study, we present the results of a comprehensive simulation study that examined how item selection methods (MFI-KLI), ability estimation methods (EAP-WLE) and classification methods (SPRT-CI) were affected by strong and weak unidimensional item pools. Findings of the study indicate that CI had always produced results with classification accuracy similar to SPRT but with a test length of almost half. Additionally, KLI and MFI item selection methods were not affected by the item pool characteristic as weak or strong unidimensionality. From the findings of this study, it can be recommended to use CI with EAP in CACT studies, whether the item pool is weak or strong unidimensional, but WLE only under strong unidimensional item pools. Additionally, the EAP and SPRT methods are recommended to prefer in the weak unidimensional item pool.

INTRODUCTION

There is a trend toward computer-based tests from paper-pencil tests in measuring individuals' ability. While all individuals answered the same items within a certain time in the paper-pencil tests; items are adjusted in accordance with the individual's ability level in Computerized Adaptive Tests (CAT). Thanks to Item Response Theory 's (IRT) bringing the items and individual (thetas) parameters on the same scale and the invariance of these parameters, each individual can complete the test in a shorter time by answering the questions appropriate to their ability level. Therefore, the ability levels of individuals can be estimated more quickly and with higher reliability, even if individuals' response different items. In educational and psychological measurement applications, decisions such as passed – failed or sick – healthy are made about individuals via Computerized Adaptive Classification Testing (CACT). In CACT, it is aimed to classify individuals into categories with few items and high classification accuracy and reach critical decisions about individuals.

Weiss and Kinsbury (1984) mentioned six main components of CAT that are (i) response model; (ii) item pool; (iii) starting rule; (iv) item selection method; (v) ability estimation method; and (vi) Termination rule. In CACT, these first five components remain constant, and the termination rule is provided by classification criteria. When comparing unidimensional IRT models as 1PL, 2PL, or 3PL, it was seen that the response model impacts the test ending (Jiao & Lau, 2003; Lau, 1996; Reckase, 1983). In the literature, item selection methods, ability estimation methods and classification criteria also affect the test length, classification accuracy and errors like bias, RMSE, or absolute error (Eggen, 1999; Eggen & Straetmans; 2000; Gündeğer, 2017; Lau & Wang, 1999; Lin & Spray, 2000; Nydick et al., 2012; Spray & Reckase, 1994; Spray & Reckase, 1996; Thompson, 2007a; Thompson & Ro, 2007; Thompson, 2009; Thompson, 2011).

Wang and Wang (2001) state that the ability estimation methods are an important CACT component that affects both the selection of the items proper for the estimated ability level and the termination of the test. In the literature, it is seen that Maximum Likelihood Estimation, Weighted Likelihood Estimation (WLE), Expected a Posteriori (EAP), Maximum a Posteriori methods are frequently examined among the ability estimation methods (Breslow & Holubkov; 1997; Cheng & Liou, 2000; Diao & Reckase, 2009; Eggen & Straetmans, 2000; Gökçe, 2012; Kalender, 2011; Kezer, 2013; Penfield & Bergeron, 2005; Tao, Shi & Chang, 2012; Wang, 1997; Wang et al., 1999; Wang & Vispoel, 1998; Wang & Wang, 2001; Warm, 1989; Wouda & Eggen, 2009; Yi, Wang & Ban, 2000). Note that all of these estimation methods make biased estimations to some extent (Warm, 1989). In CACT applications, it is aimed to estimate theta as accurately as possible and select the items appropriate for the estimated theta. Based on this, it can be interpreted that the performances of item selection methods, ability estimation methods and classification criteria depend on each other.

When the literature is examined, it is seen that Maximum Fisher Information (MFI) and Kullback-Leibler Information (KLI) are frequently used among the item selection methods in CACT (Ayan, 2018; Cheng & Liou, 2000; Diao & Reckase, 2009; Eggen, 1999; Eggen & Straetmans, 2000; Gündeğer, 2017; Lau & Wang, 1999; Lin & Spray, 2000; Spray & Reckase, 1994; Thompson, 2007a; Thompson, 2009; Thompson & Ro, 2007). MFI is based on the selection of the item that gives the highest information at the estimated theta level, whereas KLI is based on the selection of the item that gives the highest information at and around the estimated theta level (Eggen, 1999; Reckase, 1983; Spray & Reckase, 1994). These two methods consider the estimated ability level as well as be cut-point based (Thompson, 2007b). In CACT, among the classification criteria, Sequential Probability Ratio Test (SPRT), Generalized Likelihood Ratio (GLR) and Confidence Interval (CI) have also often studied in the literature (Ayan, 2018; Eggen & Straetmans, 2000; Gündeğer, 2017; Thompson & Ro, 2007; Thompson, 2009; Thompson, 2011; Nydick et al., 2012). MFI-KLI item selection methods and SPRT-GLR classification methods have the assume of unidimensionality (Eggen, 1999; Lin & Spray, 2000;

Nydick, 2013; Seitz & Frey, 2013; Spray, Abdel-fatah et al., 1997; Spray & Reckase, 1994). When item selection and classification components work together effectively, the classification of individuals is completed in a shorter time with fewer items, as expected from CACT (Spray & Reckase, 1994).

In CAT and CACT applications, maybe the most important part is the item pool which is needed to be quiet large and have high quality. Hsiehi (2015) and Thompson (2009) state that the quality of the items and number of items reduced the test length significantly (Hsiehi, 2015; Thompson; 2009). Generally, the CACT studies explain the number of items in the item pool as a pool characteristic that is reasonable but inadequate. Since the distrubition of the Test Information Function (TIF) and/or item parameters are important for CAT and CACT, the information about these features should be explained too (Gündeğer & Doğan, 2018; Kezer, 2021; Thompson, 2009; Thompson, 2011). Additionally, item banks' unidimensionality (as weak or strong unidimensionality) is a specific part of these characteristics, which is seldom studied in the literature compared to other characteristics but affects the results significantly since the item selection and classification criteria have the assume of it. Therefore, it is important and essential to examine the unidimensionality of the item pool and what kind of unidimensionality the item pool has. The aim of CACT is to make a high accuracy classification with the least number of items and ensuring this depends on the methods to be employed and naturally on the assumptions of these methods.

Unidimensionality means that there is only one latent trait that the items measure and that underlies the individuals' response performance. In other words, unidimensionality is the explanation of the variance between item responses by a single latent trait. Unidimensionality means that the items depend on a dominant dimension (Hambleton & Swaminathan, 1985). Unidimensional IRT models assume that a single latent trait underlies the responses given to the items. Therefore, unidimensional CACTs require a cut-off point (θ_0) separated range on this latent dimension. The true class decision for individual i depends on the student's estimated ability level (θ_i) relative to θ_0. If $\theta_i > \theta_0$, the student will be classified as pass-successful, and any other decision will be made in Type II error. In contrast, if $\theta i < \theta 0$, the student will be classified as fail-unsuccessful and any other decision will cause a Type I error (Finkelman, 2008).

Considering the characteristics of the item pool and the assumption of the item selection methods and the classification criteria, the concepts of weak and strong unidimensionality come to the fore along with unidimensionality. If the inter-item correlations and the factor loads of the items on one dimension are low, the item pool shows a weak unidimensional factor structure, which is close to the properties of multidimensional structures. However, if the inter-item correlations and the factor loads are high, the item pool indicates a strong unidimensional factor structure. So, how do these methods, which have a unidimensionality assumption, perform when the item pool represents weak or strong unidimensionality? Obviously, in practice, it is hard to set the item pool that has a strong unidimensionality but how do two types of unidimensionality affect the test length, estimations and accuracy? That is the main question expected to be answered by this research.

When CAT and CACT studies are examined, it is seen that Monte Carlo (MC) and Post Hoc (PH) simulations are often carried out in the R environment (Ayan, 2018; Demir, 2019; Erdem Kara, 2019; Gündeğer, 2017; Özdemir, 2015). Some studies present the dimensionality of the item pools (e.g., Ayan, 2018; Aybek, 2016; Demir, 2019; Erdem Kara, 2019; Gündeğer, 2017; Özdemir, 2015; Şahin, 2017); some present the information of unidimensionality with the item loads (e.g., Ayan, 2018; Doğruöz, 2018; Gündeğer, 2017; Şenel, 2017); and some present only the number of items as item pool characteristic (Kaçar, 2016). In fact, when MC data are generated by the software based on unidimensionality, it is important to show some evidences about how the items represent the latent trait. Flaugher (2000) states that the better the quality of the item pool, the more successful the individualized test algorithm will perform (Flaugher, 2000). For this purpose, testing unidimensionality in generated data, examining the item factor loads and specifying which type of unidimensionality data is derived is

important both in terms of revealing the item pool characteristic and in terms of the performance of item selection methods and classification criteria. The purpose and importance of this study is to determine how CACT conditions perform on the weak and strong unidimensional factor structures produced in a controlled way. Considering all these discussions, in this research, it was mainly aimed to how the test length, classification accuracy, correlation between the real theta and estimated theta, Root Mean Square Error (RMSE) and absolute error changes when the item pools represent weak or strong unidimensionalty. However, it was also examined how item selection methods (MFI-KLI), ability estimation methods (EAP-WLE) and classification methods (SPRT-CI) are affected by weak and strong unidimensionality which is an assumption for item selection and classification methods, specially. For this purpose, answers to the following sub-problems were sought:

1) How is the test length, classification accuracy, correlation between real and estimated ability levels, RMSE and absolute error in the conditions where MFI and KLI item selection methods, EAP and WLE ability estimation methods, SPRT and CI classification methods are crossed in the item pool that represents strong unidimensionality?

2) How is the test length, classification accuracy, correlation between real and estimated ability levels, RMSE and absolute error in the conditions where MFI and KLI item selection methods, EAP and WLE ability estimation methods, SPRT and CI classification methods are crossed in the item pool, which represents weak unidimensionality?

METHOD

This research was based on a Monte Carlo simulation study. Simulation allows researchers to assume the inherent complexity of organizational systems as a given. If other methods answer the questions "What happened, and how, and why?," simulation helps answer the question "What if?." Simulation enables studies of more complex systems because it creates observations by "moving forward" into the future, whereas other research methods attempt to look backward across history to determine what happened, and how (Dooley, 2002). In this section of the study, simulation design and data analysis are presented.

Simulation Design

In line with the aim of the study, ability parameters (thetas), item parameters and item response patterns were generated in SimuMIRT (Yao, 2003). Theta were derived from normal distrubition as N(0,1) for 3000 individuals. In strong and weak unidimensional item pools, items were simulated from normal distribution as N [0,1] for b parameters and from beta distrubition as B (6,16) for c parameters. Parameters were generated from Lognormal distribution as Log [2.5; 0.3] for strong unidimensional item bank and as Log [1.2; 0.3] for weak unidimensional item bank. Test Information Function (TIF) graphics of the weak and strong unidimensional item banks are given below, respectively.
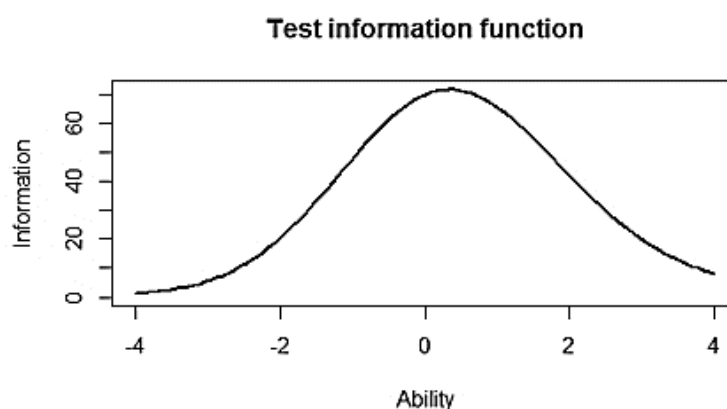

Test information function

Figure 1. *TIF of the weak unidimensional item banks*
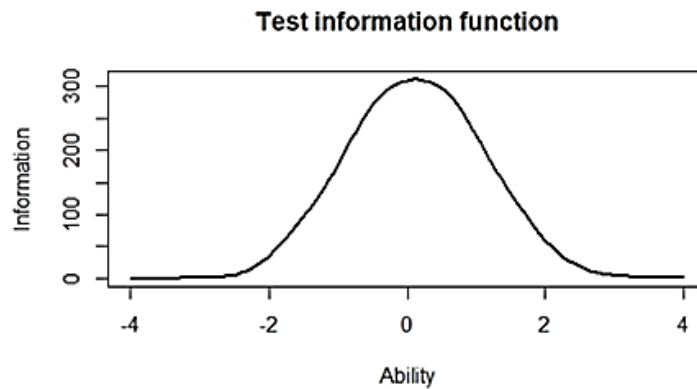
Test information function

Figure 2. *TIF of the strong unidimensional item banks*

To compare the item pools that could represent the weak and strong unidimensionality similar to Doğan et al. (2017), item factor loads were also fixed in a range. In the strong unidimensional item bank, the item factor loads were set to be in the range of 0.60–1.00 whereas in the weak unidimensional item bank the item factor loads were fixed in the range of 0.30–0.50. After generating ability and item parameters, 25 different item response patterns were simulated in SimuMIRT (Yao, 2003) and item factor loads were checked and confirmed for all patterns using confirmatory factor analysis with lavaan package (Rosseel, 2012). For classification accuracy, the ability points corresponding to the maximum point of the test information function of each item pool were used as the cut-off point. This was determined as 0.5 in both the item pools. Lastly, a Monte Carlo simulation study was performed in the R environment (R Core Team, 2019) in accordance with the study' conditions presented in Table 1.

Table 1. *Simulation conditions of the research*

Conditions	Levels
Item pool/bank unidimensionality	Strong, Weak
Item selection method	MFI, KLI
Ability estimation method	EAP, WLE
Classification method	SPRT, CI

Data Analysis

As seen in Table 1, the independent variables of this study are item bank unidimensionality (weak and strong unidimensional), item selection method (MFI and KLI), ability estimation method (EAP and WLE) and classification method (SPRT and CI). The dependent variables are test length, classification accuracy, correlation between the real theta and estimated theta, Root Mean Square Error (RMSE) and absolute error (AE). Because the simulation study was based on 25 replications, the results were summarized over the average of the replications. RMSE and AE are calculated using the following formula:

$$\text{RMSE} = \sqrt{\frac{\sum_1^N (\theta_t - \theta_e)^2}{N}}$$

$$\text{AE} = \frac{\sum_1^N |\theta_t - \theta_e|}{N}$$

where θ_e is the estimated ability parameter, θ_t is the true ability parameter, N is the number of individuals.

Ethic

Since this study was a simulation study, ethics committee approval was not required.

RESULTS

In line with the purpose of the study, the average values of the test length, classification accuracy, Pearson correlation between the real thetas and estimated thetas, Root Mean Square Error and absolute error are calculated and presented in Table 2.

Table 2. *The average values of the study's conditions*

Item Bank/Pool	Item Selection Method	Ability Estimation Method	Classification Method	TL	CA	r	RMSE	AE
Weak Unidimensional	MFI	EAP	SPRT	49.09	0.92	0.95	0.34	0.27
			CI	20.89	0.91	0.82	0.52	0.43
		WLE	SPRT	49.25	0.92	0.95	0.39	0.31
			CI	19.67	0.90	0.80	0.80	0.61
	KLI	EAP	SPRT	49.08	0.92	0.95	0.34	0.27
			CI	20.77	0.91	0.82	0.52	0.43
		WLE	SPRT	49.25	0.92	0.95	0.39	0.32
			CI	19.68	0.90	0.80	0.81	0.61
Strong Unidimensional	MFI	EAP	SPRT	27.75	0.94	0.94	0.70	0.64
			CI	8.74	0.93	0.87	0.56	0.48
		WLE	SPRT	28.12	0.93	0.94	0.75	0.68
			CI	8.37	0.92	0.87	0.61	0.52
	KLI	EAP	SPRT	27.80	0.94	0.94	0.70	0.64
			CI	8.73	0.93	0.87	0.56	0.48
		WLE	SPRT	28.19	0.93	0.94	0.75	0.68
			CI	8.30	0.92	0.87	0.61	0.52

TL = Test Length; CA = Classification Accuracy; r = Correlation between the real theta and estimated theta, RMSE = Root Mean Square Error; AE = Absolute Error; TL, CA, r, RMSE and AE were calculated by taking the average values of 25 replications.

As shown in Table 2, SPRT has the highest value in all conditions in terms of TL. Based on these findings, it can be said that SPRT needs more items than CI to classify the individuals. In other words, SPRT performed worse than CI in terms of test efficiency. However, a noteworthy point in these findings is that the TL values of SPRT differ significantly between the strong and weak unidimensional item pools. In Figure 3, it is seen that in all conditions, the TL values decreased in the strong unidimensional item pool and SPRT has the most significant decline. While SPRT requires approximately 49 items in the weak unidimensional item pool; it can classify individuals with 28 items in the strong unidimensional item pool. Based on these findings, it can be said that SPRT performs better in the item pools, which represent a strong unidimensionality. The literature showed us that SPRT needs more items to end the CACT and performs worse in terms of the TL (Ayan, 2018; Eggen & Straetmans, 2000; Gündeğer, 2017; Nydick et al., 2012; Thompson, 2011). This may be due to the generated item pools' characteristics. Based on this finding, it can be commented that in order for SPRT to be able to classify individuals with few items, one-dimensionality, which is an assumption of SPRT, must be provided strongly. In other words, if the inter-item correlations and the factor loads are high as in the range of 0.60–1.00, SPRT can classify with less number of items, as expected from CACT applications.
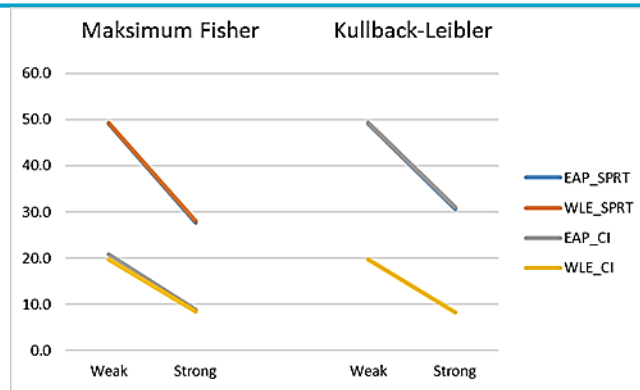
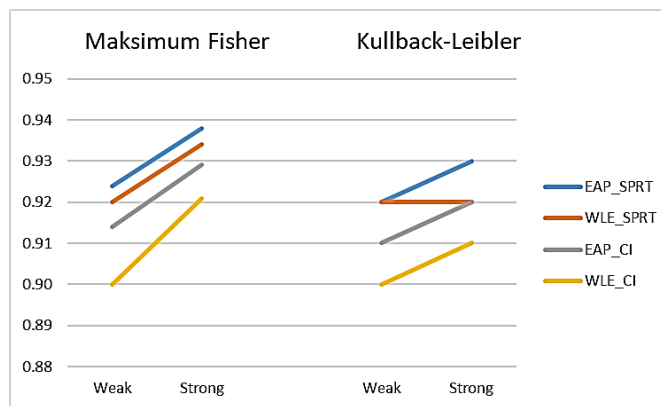**Figure 3.** *Findings on test length*

Figure 4. *Findings on classification accuracy*

According to Table 2, in all conditions, the classification accuracy (CA) has a high rate above 90%, which overlaps with the literature (Gündeğer, 2017; Thompson, 2011; Thompson & Ro, 2007; Nydick et al., 2012). In Figure 4, it is seen that almost all the CA values obtained from the strong unidimensional item pool increased compared with the weak unidimensional item pool. Accordingly, it can be said that the item pool characteristics affect the classification of individuals into the pass-fail categories, too. In all conditions, the correlation between the true theta and the estimated thetas has above 0.80 that indicates a positive and high correlation, as expected from CAT and CACT applications. Accordingly, it can be said that in all conditions the methods perform well in terms of the relationships between individuals' true ability levels and estimated ability levels. In Figure 5, it has been concluded that the r values obtained from the CI conditions vary, especially in terms of the item pool characteristic, whereas the r values of the SPRT conditions don't differ much. When the CI method is used in a strong unidimensional item pool, the correlation between the true and estimated values increases. In other words, in the strong unidimensional item pool, the estimated abilities of individuals are quite close to their true ability levels. So, it can be said that CI performs better in terms of r values, when the item pool shows a strong unidimensional characteristic. In the r values of SPRT conditions are higher than the r values of CI values overlap with the literature, too (Gündeğer, 2017).
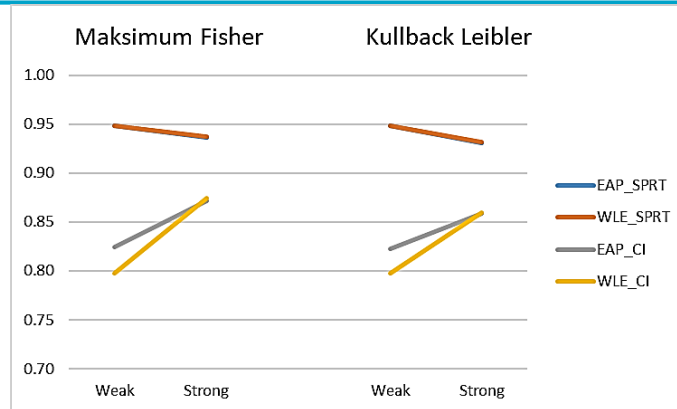
Figure 5. *Findings on correlation*

In Table 2, the RMSE and AE values indicate the error in the final ability estimations. Although there is no absolute threshold for errors, it is possible to make a relative comparison. It can be said that the lower the error, the stronger the prediction. In Figures 6 and 7, it is seen that almost all the errors vary between the strong and weak unidimensional item pools. When the EAP and CI methods are used together, the errors do not show any change in terms of the item pool. Regardless of the item selection methods and ability estimation methods, it was concluded that, in the strong unidimensional item pool, the error values of SPRT increased. Another noteworthy finding of the study is that the errors show a decrease in the strong unidimensional item pool when the WLE and CI methods are used together. Accordingly, the most appropriate methods, in terms of errors, are EAP and CI together in the strong unidimensional item pool, whereas are EAP and SPRT together in the weak unidimensional item pool.
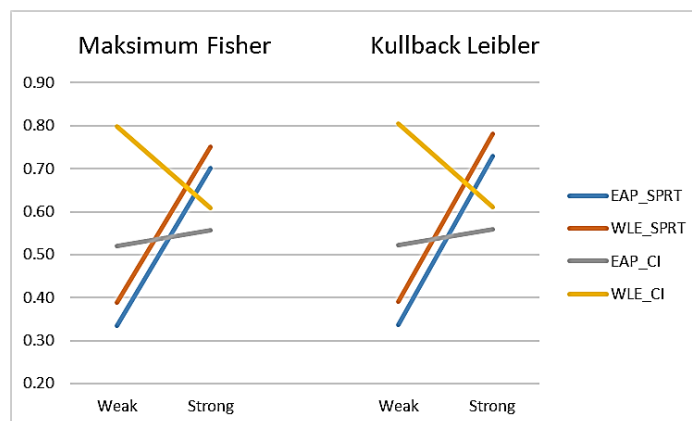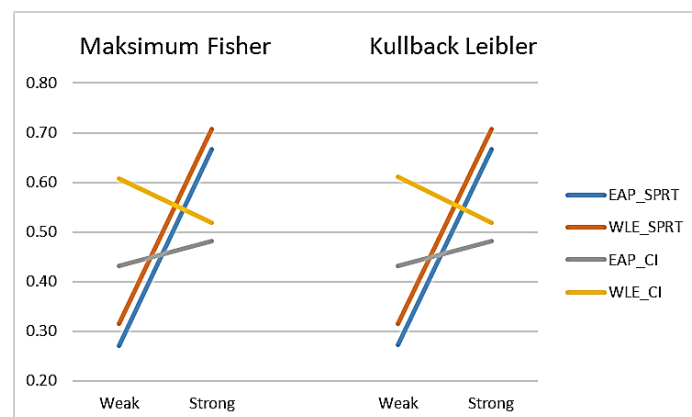

Figure 6. *Findings on RMSE*

Figure 7. *Findings on absolute error*

DISCUSSION, CONCLUSION, RECOMMENDATIONS

In this research, we investigated how the weak and strong unidimensional item pools affect the CACT ending in terms of test length, classification accuracy, the correlation between the true theta and the estimated theta, RMSE and absolute error, which are the dependent variables of the study. In the line with the aim of the study, 16 conditions were composed of different item pools, item selection, ability estimation and classification methods. The conditions were compared to each other in terms of the dependent variable values by taking the mean over 25 replications. It is impossible to propose a direct method based on the research results and all the dependent variables. Therefore, the dependent variables are handled separately below.

A result of this study is that the classification accuracy (> 0.90) and the correlations between the true theta and estimated theta (> 0.80) were calculated at a very high level in all conditions. In terms of test length, it was concluded that the CI classification criterion was generally more useful than SPRT. These three results of this research coincide with those from the relevant literature (Ayan, 2018; Eggen & Straetmans, 2000; Gündeğer, 2017; Nydick et al., 2012; Thompson, 2011). From this viewpoint, if SPRT is to be used as a classification criterion, it may be recommended to test whether the item pool shows strong unidimensionality and to use SPRT if the item pool has this characteristic. If the item pool shows weak unidimensionality rather than strong, CI should be preferred over SPRT to ensure test effectiveness.

The focus of this research is the unidimensionality that is an assumption for item selection (MFI and KLI) and classification methods (SPRT and CI) and a characteristic for the item pool. A striking finding of the study, when the criteria are test length and accucary classification, is that SPRT was performed better in the strong unidimensional item pool than in the weak unidimensional item pool. In the strong one, SPRT reduced the number of items by half, which is an acceptable number (28) to end a test session. In other words, in a weak unidimensional item pool, SPRT requires approximately 49 items, but in strong one it needs only 28 items to end the CACT application, which shows us that the SPRT is useful when the item pool has strong dimensionality. However, it should not be ignored that as the strength of the unidimensionality increases, the bias of the true ability parameter estimates in SPRT increases noteworthily under both ability estimation methods. When the strength of dimensionality increases in the CI method, the difference between actual and estimated ability barely increases, and the test length becomes significantly shorter with high classification accuracy. Additionally, KLI and MFI item selection methods are not affected by the item pool characteristic as week or strong unidimensionality. Both item selection methods have the same pattern and the same result under all output criteria throughout the type of unidimensionality in themselves.

Many researchers do not provide information about the unidimensionality of the item pool they derived in MC or PH simulations, especially in CAT and CACT studies. However, to draw attention to this situation in this research, the item loads are fixed in a range so that they show weak and strong correlations and unidimensionality. When the literature is examined, it is seen that unfortunately, there is no detail about data generation. Besides, this type of information shows us the item pool characteristic, and these research results prove that the characteristic of the item pool has a significant impact on CACT, it is highly recommended that with the information on how many items the item pool consists of, the item factor loads, inter-item correlations and TIF should be presented in papers and interpreted the results taking these information into account. At this point, researchers and practitioners may be advised to further examine the item pool characteristic with factor analytic methods and/or to report item factor loads. Based on these study results, then it may be recommended to prefer the CI classification method regardless of the unidimensionality of the item pool because CI has always produced results with classification accuracy similar to SPRT but with a test length of almost half.

Another result of the study is that the ability estimation methods and the classification criteria produced errors at different levels in item pools shows strong and weak unidimensionality. It is another remarkable finding that the EAP estimation method outperforms in terms of both classification accuracy and ability parameter recovery under all conditions. It can be recommended to use CI with EAP in CACT studies, whether the item pool is weak or strong unidimensional, but WLE only under strong unidimensional item pools. Additionally, the EAP and SPRT methods are recommended to prefer in the weak unidimensional item pool. With the increase in the strength of the unidimensionality of the item pool in the study, the test length decreased by almost half, but the increase in the bias in ability parameter recovery is also remarkable. We didn't consider whether the cut-off point had an effect on this result. This was because the cut-off point was set as the mode of the test information function in this study. It is considered that the effect of the unidimensionality level of the item pool on Computerized Adaptive Classification Testing needs further investigation with different absolute cut-off points. The consistency between the results of this research and future studies on this subject can be examined.

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Investigation of the Relationship between Food Craving, Cognitive Flexibility and Social Appearance Anxiety in Emerging Adulthood[1]

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Article Info	ABSTRACT
	In this study, it was aimed to reveal the predictive power of demographic characteristics, cognitive flexibility and social appearance anxiety of individuals in emerging adulthood on preoccupation with the thought of eating and loss of control over eating, which are the sub-dimensions of food craving. The design of the research was structured according to the relational screening model. The study group of the research consists of 551 participants, 395 (71.7%) women and 156 (28.3%) men. "Food Cravings Questionnaire-Trait Short Form", "Cognitive Flexibility Inventory", "Social Appearance Anxiety Scale" and "Personal Information Form" were used to collect research data. Correlation analysis was used to determine the relationship between food craving, cognitive flexibility and social appearance anxiety. Hierarchical regression analysis was used to determine the predictors of food craving of individuals in emerging adulthood. Considering the dimension of preoccupation with the thought of eating, while the alternatives, one of the sub-dimensions of cognitive flexibility, do not make a specific contribution to the model, the control sub-dimension makes a unique contribution to the model. When the sub-dimension of loss of control over eating is considered, alternatives from the sub-dimensions of cognitive flexibility make a low-level significant contribution to the model, while the sub-dimension of control makes a unique contribution to the model. The research results showed that the sub-dimensions of cognitive flexibility is an important predictor of preoccupation with the thought of eating and loss of control over eating, and similarly, social appearance anxiety is an important predictor of all sub-dimensions of food craving.

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INTRODUCTION

Eating is one of the biological activities of humans. However, eating, beyond being a biological activity in human life, also has an important psychological and social place. Eating behavior is a complex process. It provides the necessary input for basic body functions and can be stimulated by hunger, desire or hedonistic sensations (Ahima & Antwi, 2008). People have to determine when and how much to eat, but sometimes this process does not work as in eating disorders. In this case, behaviors such as not being able to control food craving, vomiting after binge eating attacks or reducing food intake due to fear of weight gain are observed.

The excessive desire to consume a food product is defined as food craving (Weingarten & Elston, 1990). Food craving differs from other hunger types because it is a specific and intense emotion (Hill, 2007). A state of hunger is not necessary for this intense desire to eat (Pelchat & Schaefer, 2000). When the literature is examined, it is seen that food craving is affected by many psychological factors (Conner, 2006; Ogden 2010), the individual's mood and characteristic features (Eskici, 2020). Eating is not an automatic process and is influenced by the complex relationship between psychological, physiological, genetic and social factors that affect eating time, amount of food consumption and food preferences (Grimm & Steinle, 2011).

In eating behavior, individuals are faced with options that encourage food intake in an environment where there are highly delicious foods (Svaldi et al., 2014). In this series of options, patients with Anorexia Nervosa decide to stop eating; the decision to stop eating in patients with bulimia nervosa is interrupted by the urge to eat, and in patients with obesity, the decision to diet and lose weight often results in indecision. Here, the necessity of a regulatory process for decision-making emerges. The regulatory process related to resistance to acting impulsively, behavior inhibition and decision making is related to executive functions (Hofmann et al., 2012).

Executive functions encompass a set of cognitive processes that allow the initiation, planning, regulation, inhibition, sequencing, and realization of goal-directed behavior and complex thinking that may affect eating behavior (Raman et al., 2013). Executive functions express the cognitive process independent of the domain that forms the basis of voluntary behavior, and inhibition and cognitive flexibility in these processes are the two most basic executive functions (Gültekin Ahçı, 2016). Here, the importance of the concept of cognitive flexibility draws attention. Cognitive flexibility includes responding appropriately to new situations and stimuli, coping with new and difficult situations, being aware of options, and generating alternative ideas (Stahl & Pry, 2005).

When the literature is examined, it is seen that those with obesity problems have difficulties in continuing their actions towards a healthy and balanced diet and in changing their eating habits (Gerdan & Kurt, 2020). This situation is directly related to cognitive flexibility. In addition, studies on the subject have shown that patients with Anorexia Nervosa have poor cognitive flexibility (Tchanturia et al., 2011). Inadequacies in cognitive flexibility constitute a risk factor for the occurrence of eating disorders (Chanturia et al., 2004; Roberts et al., 2007).

Another risk factor is gender difference. Eating disorders are a group of diseases in which gender differences are most evident (Gürdal Küey, 2008). Disturbed eating behaviors are more common in women than in men (Davison & Neale, 2004). The results of epidemiological studies on the subject show that adolescence and young adulthood are high-risk periods for the development of disturbed eating behavior (Garner et al., 2009).

It is thought that the situation affecting the prevalence of disturbed eating behaviors in women in adolescence is the changes in this period and the inadequacy in adapting to the changes (Yücel, 2009). The level of cognitive flexibility is important to be flexible while adapting to changes and to produce alternative solutions to difficult situations. Cognitive flexibility helps the individual by contributing to

the ability to adapt in the face of negative situations and creates a protective effect (Yavuz & Kutlu, 2016).

One of the developmental needs of the adolescence period is to accept one's own body, and if one's own body is not accepted, negative body perception occurs (Oktan, 2012). In the stage of adapting to and accepting the changes experienced during adolescence, mental preoccupation with body shape is seen especially in girls (Rosenblum & Lewis, 1999; Yücel, 2009). Nowadays, with the importance of physical attractiveness, the incompatibility between the perfect body and his/her own body in the mind of the individual causes a distorted body perception, and this wrong perception creates many unhealthy behaviors (Oktan, 2012). There is a relationship between dissatisfaction with one's body and eating disorders (Hill et al., 2013; Wendell et al., 2012). McCabe & Ricciardelli (2001) stated that during adolescence, 40-60% of girls have eating behaviors accompanying their dissatisfaction with their bodies. Individuals with positive body image respect their own bodies and are less prone to eating disorders (Wood-Barcalow et al., 2010). Individuals who have a negative perception about their body think that others, also, do not find them attractive. On the contrary, an individual with a positive self-perception feels more comfortable in social environments because of having a positive self-perception (Antony & Swinson, 2008).

It is stated that individuals who have a negative perception towards their bodies experience social physical anxiety and this anxiety includes similar situations with anxiety (Haase et al., 2007). Social appearance anxiety occurs as a result of the social physical anxiety experienced by the individual (Hart et al., 2008). Social appearance anxiety arises as a result of negative thoughts, feelings and behaviors related to the physical appearance and body shape of the individual (Doğan, 2010).

Social appearance anxiety is thought to emerge during adolescence. The reason for this is that young people at that time experience intense anxiety about how their physical appearance is perceived by others (Gümüş, 2000). La Greca and Lopez (1998) found in their study that young people who are not satisfied with their physical appearance experience social appearance anxiety more intensely. This intense anxiety can cause the individual to display irregular and unhealthy eating behavior. In a study conducted on athletes, it was determined that athletes with intense social appearance anxiety tend to have an unhealthy diet (Tekkurşun Demir et al., 2021).

When the relevant literature is examined in line with the information above, no study was found examining the relationship between food craving, cognitive flexibility, and social appearance anxiety. As a result, the aim of this study is to reveal the predictive power of demographic variables (gender, age), cognitive flexibility levels and social appearance anxiety on the food craving of individuals in emerging adulthood.

METHOD

In this section, the model in which the research is structured, the study group of the research, data collection tools and data collection processes are included.

Research Design

The design of the research was structured according to the relational survey model, one of the descriptive survey methods. The relational survey model aims to reveal the existence of co-change between one or more variables without manipulating them and the degree of the relationship, if any (Gürbüz & Şahin, 2015). While cognitive flexibility and social appearance anxiety are the independent variables of the study, the dependent variable is the food craving.

Study Group

The study group consists of individuals between the ages of 20-28. Participants were determined using the convenience sampling technique. For convenience sampling method, the researcher creates

the sample starting from the participants with whom the data can be easily collected in order to reach the number of samples needed (Büyüköztürk et al., 2016). Convenience sampling saves time and cost and aims to include people who want to be included in the sample (Ural & Kılıç, 2011). A total of 551 people, 395 (71.7%) women and 156 (28.3%) men, participated in the research. The average age of the participants is 20.81.

Research Instruments and Processes

"Personal Information Form (PIF)", "Short Form of Food Cravings Questionnaire-Trait (FCQT-R)", "Cognitive Flexibility Inventory (CFI)" and "Social Appearance Anxiety Scale (SAAS)" were used to collect data. Before the data collection process, necessary permissions to apply the scale were obtained. The data were applied to individuals who volunteered between the years 2021-2022 through the online form prepared by the researcher. The forms prepared online for the data collection process were applied by the researcher in a face-to-face and supervised environment.

Short Form of Food Cravings Questionnaire-Trait (FCQT-R)

Short Form of Food Cravings Questionnaire-Trait, developed by Cepeda Benito et al. (2000) and adapted to Turkish by Traş and Gökçen (2021), consists of 15 items. The scale has two sub-dimensions. One of these sub-dimensions is "preoccupation with the thought of eating" and the other is "loss of control over eating". The statements in the scale are in the form of a six-point Likert scale as "Never", "Rarely", "Sometimes", "Often", "Usually" and "Always". The scale is scored between 15 and 90. Cronbach's alpha internal consistency was used to determine the reliability of the scale. The internal consistency coefficient of the sub-dimension of preoccupation with the thought of eating is .93. The internal consistency coefficient of the dimension of loss of control over eating has a value of .91. The Guttman two-half test reliability coefficient for the whole scale is .93, and the internal consistency reliability coefficient is .94. The fact that the reliability coefficients have a value higher than .70 is proof that the scale is reliable (Gürbüz & Şahin, 2015). Confirmatory factor analysis (CFA) was used to determine the validity of the scale. According to the CFA analysis results, the χ^2/sd value, in which the model's good fit limits were tested, was found to be 4.89. Other fit index values are RMSEA=.07, CFI=.94, GFI=.91, NFI=.93, SRMR=.036. The obtained values are an indication that the model is in good fit index. According to exploratory factor analysis (EFA) results, Barlett Test of Sphericity value was found as χ^2=5868.707 sd=105 (p=.000) and Kaiser-Meyer-Olkin (KMO) sample fit coefficient was found as .92. A KMO value of .60 and above indicates that the sample is suitable for the application (Gürbüz & Şahin, 2015).

Cognitive Flexibility Inventory (CFI)

The scale, which was developed by Dennis and Wal (2010) and adapted into Turkish by Sapmaz and Doğan (2013), consists of two sub-dimensions (Alternatives and Control) and a total of 20 items. The statements of the scale are scored between "Strongly Disagree (1)" and "Strongly Agree (5)" and are in the form of a five-point rating. In order to test the reliability of the scale, the test-retest method and the Cronbach's alpha internal consistency coefficient method were used. The Cronbach's alpha internal consistency coefficients of the sub-dimensions of the scale were .90 for the alternatives and .84 for the control; for the whole of the scale, this value was calculated as .90. The reliability coefficient obtained as a result of the test-retest method was .78 for the alternatives sub-dimension and .73 for the control sub-dimension; .73 for the whole scale. Criterion-related validity, EFA and CFA were used to test the validity of the scale. According to the EFA results, the Barlett Test of Sphericity value was found to be 3892.36 (p<.001) and the KMO sample fit coefficient was found to be .92. The values obtained as a result of the CFA analysis (RMSEA= .054, GFI= .92, NFI= .96, RFI= .95, CFI= .98, IFI= .98, χ^2/sd 2.44, RMR=.052) are within the scope of the fit index.

Social Appearance Anxiety Scale (SAAS)

The scale developed by Hart et al. in 2008 and adapted into Turkish by Doğan (2010) has a one-dimensional structure. The statements of the scale, which consists of 16 items in total, are scored on a five-point Likert scale between "Strongly Disagree (1)" and "Strongly Agree (5)". The Cronbach's alpha internal consistency coefficient for the entire scale is .93. The test-retest reliability coefficient is .85 and the reliability coefficient calculated and obtained using split half method is .88. The construct validity of the scale was tested with EFA and CFA. According to the results of EFA analysis, Barlett Test of Sphericity value was found as $\chi2= 2674.01$ (p<.001) and KMO sample fit coefficient was found as .94. The values obtained according to the CFA analysis results (RMSEA=0.051, NFI=0.98, CFI=0.99, IFI=0.99, RFI=0.98, GFI=0.93, AGFI=0.90) are within the scope of acceptable fit.

Data Analysis

Hierarchical regression analysis was used to determine the predictors of food craving of individuals in emerging adulthood. The analysis performed to determine to what extent more than one independent variable predicts the dependent variable is called multiple regression analysis (Altunışık et al., 2010). In hierarchical regression analysis, predictive variables are included in the analysis depending on the order determined by the researcher. In the hierarchical method, the predictor variables that were analyzed first are the control variables in terms of the predictor variables that will be included in the analysis later (Büyüköztürk et al., 2016). The analysis of the data obtained from the participants was carried out in the SPSS 17.00 package program.

After checking whether the data set is suitable for hierarchical analysis, data analysis was started. For this purpose, firstly the "Mahanalobis" distance value was calculated and the outliers were obtained and removed. Initially, data were collected from 569 participants. Then, the answers of 551 participants were included in the analysis, since the answers of 18 participants were found to be outliers. After removing the outliers, kurtosis and skewness coefficients, mode, mean and median values were examined in order to investigate whether they showed a normal distribution. The modes, median and mean values of the scores obtained from the data collection tools are close to each other, and the skewness and kurtosis coefficient values between -1 and +1 indicate that the distribution is close to the normal distribution. The mean, mode, median values and skewness and kurtosis coefficient values of the scales are presented in Table 1.

Table 1. *Mean, Median and Mode Values of FCQT-R, CFI and SAAS Scores*

Variables	$\overline{X}$	Mode	Median	KC/KCSE	SC/SCSE
CFI	3.64	3.80	3.7	-.600/.104	.800/.208
SAAS	2.29	1.25	2	.847/.104	-.268/.208
FCQT	2.32	1.27	2	.992/.104	.329/.208

CFI: Cognitive Flexibility Inventory, SAAS: Social Appearance Anxiety Scale, FCQT-R: Short Form of Food Cravings Questionnaire-Trait, KC: Kurtosis Coefficient, KCSE: Kurtosis Coefficient Standard Error, SC: Skewness Coefficient, SCSE: Skewness Coefficient Standard Error

Another issue to be considered when performing multiple regression analysis is the multicollinearity problem. Multicollinearity problem refers to the situation where the correlation coefficients of two or more variables are higher than .75 (Albayrak, 2005).

When Table 1 is examined, the relationship of the independent variables does not create a multicollinearity problem. Examining the VIF (variance inflation factor) and TV (tolerance value) is another method used to detect the multicollinearity problem. If VIF values are equal to or higher than 10 and TVs are lower than .10, a linear connection problem occurs (Albayrak, 2005). When the VIFs and TVs are examined, it is seen that the TVs of the independent variables are higher than .10 and the VIF values are less than 10. As a result of these values, it is seen that there is no multicollinearity problem between the independent variables of the research. When Table 1 is examined, the correlation between the independent variables of the research is not higher than .75, so it does not create a

connection problem.

Analysis results indicate that the data are suitable for hierarchical regression analysis. The relationship between food craving, cognitive flexibility and social appearance anxiety was determined using correlation analysis. Multiple hierarchical regression analysis was used to reveal the predictive power of cognitive flexibility and social appearance anxiety, which are independent variables, and desire to eat, which is the dependent variable. In the hierarchical regression analysis, control variables (age and gender) were included in the model first. Gender variable was included in the model by being coded (1 as female, 2 as male) since it is a discrete variable. As the age is a continuous variable, it was directly included in the model.

Ethic

Ethical issues such as confidentiality and informed consent were taken into consideration during the data collection phase. Before the research was conducted, ethical approval was obtained from the Social and Human Sciences Scientific Research Ethics Committee of Necmettin Erbakan University with the decision number 2022/213. This research was conducted with the permission of Necmettin Erbakan University, Social and Human Sciences Scientific Research Ethics Committee, with the decision dated 10/06/2022 and numbered 10302.

FINDINGS

The findings obtained as a result of the correlation analysis and hierarchical regression analysis performed to determine the relationship between the variables of cognitive flexibility, food craving and social appearance anxiety of individuals in emerging adulthood are included in this section.

The findings of the correlation analysis between the scores of the participants in the short form of food cravings questionnaire, the cognitive flexibility inventory, and the social appearance anxiety scale are presented in Table 2.

Table 2. *Pearson's Correlation Values Showing the Relationship between FCQT-R, CFI, and SAAS*

VARIABLES	1	2	3	4	5
FCQT-R					
1. Preoccupation with the Thought of Eating	-	.82**	.34**	-.10*	.36**
2. Loss of Control over Eating		-	.36**	-.16**	.38**
CFI					
3. Control			-	-.24**	.45**
4. Alternatives				-	-.23**
SAAS					
5.					-

p< .01**, p< .05* CFI: Cognitive Flexibility Inventory, SAAS: Social Appearance Anxiety Inventory, FCQT-R: Food Cravings Questionnaire Short Form

As can be seen in Table 2, there is a positive and low-level significant relationship between Preoccupation with the Thought of Eating dimension of Food Cravings Questionnaire and Control (r= .34, p< .01), one of the sub-dimensions of the Cognitive Flexibility Inventory, while a low-level significant negative correlation was observed with Alternatives (r= -. 10, p> .05). In addition, the relationship between Preoccupation with the Thought of Eating, which is a sub-dimension of Food Cravings Questionnaire and Social Appearance Anxiety (r= .36, p< .01) was found to be low, positive and statistically significant.

While a low-level positive and significant correlation was observed between the Loss of Control Over Eating dimension of the Food Cravings Questionnaire and the Control (r= .36, p< .01), one of the sub-dimensions of the Cognitive Flexibility Inventory, and a low-level significant and negative relationship was observed with the Alternatives sub-dimension (r= -.16, p< .05).). In addition, a positive and low-level significant relationship was found between Loss of Control over Eating and Social Appearance Anxiety (r= .38, p< .01).

When we look at the relationship between Cognitive Flexibility and Social Appearance Anxiety, there is a positive and moderate relationship with Control (r= .45, p< .01) and a low-level negative and significant relationship with Alternatives (r= -.23, p< .01).

The hierarchical regression analysis findings regarding the predictive power of the participants' demographic variables (age and gender), (preoccupation with the thought of eating and loss of control over eating) and social appearance anxiety scores on cognitive flexibility (control and alternatives) scores are presented in Table 3.

Table 3. *Hierarchical Regression Analysis Findings for Cognitive Flexibility and Social Appearance Anxiety to Predict Food Craving (N=551)*

		FOOD CRAVING			
		Preoccupation with the Thought of Eating		Loss of Control over Eating	
	Predictives	ΔR^2	β	ΔR^2	B
1. Demographic Variables	Age	.00	-.06	.00	-.05
	Gender		-.08		.08
2. Cognitive Flexibility	Control	.12**	.50**	.14**	.52**
	Alternatives		-.04		-.14*
3. Social Appearance Anxiety		.16**	.31**	.19**	.30**
	Total R^2	.26**		.33**	

*p<.05, **p<.001

In Table 3, food craving is discussed in terms of demographic variables, cognitive flexibility, and social appearance anxiety using hierarchical regression analysis. In Table 3, when dealing with the preoccupation with the thought of eating, one of the sub-dimensions of food craving, demographic variables (age and gender) included in the first step of the model did not contribute to the model, while cognitive flexibility (R²=.12, p<.001) included in the second step of the model.) and social appearance anxiety, which was included in the third step, contributed significantly to the model (R²=.16, p<.001). Cognitive flexibility made a 12% contribution to the model. While the Alternatives, one of the sub-dimensions of cognitive flexibility, did not make a specific contribution to the model, the Control sub-dimension made a specific contribution to the model (β= .50, p<.001). In other words, as the Control scores increase, the scores of preoccupation with the thought of eating also increase. The contribution of social appearance anxiety, which is included in the model in the third step, to the model is 15% (R²=.15, p<.001). As the social appearance anxiety scores increase, the scores of preoccupation with the thought of eating also increase (β= .31, p<.001).

In Table 3, considering the loss of control over eating, which is one of the sub-dimensions of food craving, demographic variables (age and gender) included in the first step of the model did not contribute to the model, while cognitive flexibility (R²=.14, p<. 001) and social appearance anxiety,

which was included in the third step, appeared to make a significant contribution to the model (R^2=.19, p<.001). The contribution of cognitive flexibility to the model was 14%. Alternatives, one of the sub-dimensions of cognitive flexibility, makes a low-level significant contribution to the model (β= -.14, p<.05). As the scores from the Alternatives sub-dimension increase, the scores from the loss of control over eating sub-dimension decrease. The Control sub-dimension makes a unique contribution to the model (β= .52, p<.001). In other words, as the scores from the Control dimension increase, the scores from the loss of control over eating dimension also increase. Social appearance anxiety, which was included in the model in the third step, contributed 15% to the model (R^2=.19, p<.001). As the level of social appearance anxiety increases, the scores for loss of control over eating also increase (β= .30, p<.001).

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

In this study, how cognitive flexibility and social appearance anxiety of individuals in emerging adulthood predict their food craving is discussed. When the results were examined, cognitive flexibility and social appearance anxiety levels of individuals in emerging adulthood were found to be important predictors of their food craving. When the literature was examined, no research was found that examines the relationship between food craving, cognitive flexibility and social appearance anxiety variables.

According to the research results, cognitive flexibility is an important predictor of food craving. Control and Alternatives sub-dimensions of cognitive flexibility have predictive power on preoccupation with the thought of eating and loss of control over eating, which are sub-dimensions of food craving. It appears that as cognitive control (Gabrys et al., 2018), which includes focusing on information relevant to the situation, increases, the individual becomes more preoccupied with the thought of eating. At the same time, it was concluded that if the cognitive control is high, the loss of control over eating is also high. When the literature is examined, it is seen that there are studies that reveal the relationship between food craving and cognitive flexibility and support the current research results (Chanturia et al., 2004; Roberts et al., 2007; Tchanturia et al., 2011). Afzali et al. (2021), in their study on food craving, attentional bias towards food, and cognitive flexibility in individuals with binge eating disorder, revealed that cognitive flexibility has an effect on food craving. In this case, it can be said that individuals with high cognitive flexibility can adjust their behavior against changing situations and environmental stimuli and can also control their excessive desire to eat because they can be aware of options.

In addition, it was concluded that as the ability to produce cognitive alternatives increases, the loss of control over eating and preoccupation with the thought of eating decreases. It is seen that individuals with high scores from the Alternatives sub-dimension, which expresses the ability to produce possible solutions in difficult situations that occur in the individual's life, experience less loss of control over eating and are less preoccupied with the thought of eating. This situation shows that individuals with high scores from the Alternatives do not use eating activity as a coping strategy. In the literature, there are study results stating that individuals who do not have the ability to produce alternative solutions tend to eat as a coping strategy in a stressful situation. In their study, İnançkal and Arslantaş (2021) stated that individuals with low problem solving and coping strategy development skills have high emotional eating scores. The result of the research supports the findings obtained. In this case, it can be said that individuals who can find a different alternative instead of turning to eating behavior in the face of a stressful situation have less problems with food craving.

Social appearance anxiety, which is included in the model in the third step of the research, makes a high contribution to the model in both sub-dimensions of food craving. It was observed that as social appearance anxiety scores increased, preoccupation with the thought of eating and loss of control over eating also increased. It was observed that individuals who have a high level of anxiety about their

social appearance have a high level of food craving. This can be explained by the fact that negative feelings such as anxiety and stress lead the individual to eating behavior. Tan and Chow (2014) stated in their study that the level of stress experienced increases the amount of eating. Similarly, high anxiety can affect the eating behavior of the individual and cause him/her to consume more food (Faraj & Fırat, 2022). It is seen that the desire of individuals to eat increases in times when social appearance anxiety is intense. Erdoğan et al. (2019) stated that there is a positive and significant relationship between eating attitude and anxiety. These results support the research findings.

When the literature was examined, no study was found that examined the relationship between food craving and social appearance anxiety. For this reason, studies on eating disorders and social appearance anxiety were examined. In the literature, there are studies that support the results of the current research and show that social appearance anxiety is associated with disturbed eating behavior (Erdoğan et al., 2019; Fitzsimmons-Craft et al., 2012; Hill et al., 2013; Kaye et al., 2004; Özkan, 2019; Thompson & Chad, 2002; Turel et al., 2018; Utschig et al., 2010; Wendell et al., 2012; Wonderlich-Tierney & Wal, 2010). Turel et al. (2018), in their study examining the effects of body image, socio-cultural attitudes, appearance anxiety, and depression on eating disorders of university students, revealed that appearance anxiety predicted eating disorders. Kaye et al. (2004) stated that eating disorders and social appearance anxiety are highly comorbid. In their study, Ustchig et al. (2010) revealed that fear of negative evaluation is a risk factor for body dissatisfaction, pressure to be thin, diet restriction and negative emotions, and in terms of bulimic symptoms. Thompson and Chad (2002) stated that social appearance anxiety poses a risk for eating disorders in young women. Erdoğan et al. (2019), in their study examining the relationship between eating attitude and social appearance anxiety variables, found a significant relationship between these variables. Özkan (2017) revealed the significance of the relationship between emotional eating behaviors and social appearance anxiety in his study. When the studies on eating disorders and social appearance anxiety variables are examined, it is seen that the findings are similar to the results of the current study.

Although the current research is limited to individuals aged 20-28 in emerging adulthood, it reveals a causal relationship in terms of method. It is thought that this study will make a unique contribution to the literature in terms of revealing the predictive relationships between the variables of food craving, cognitive flexibility and social appearance anxiety. Because studies on food craving are limited in number, and there are limited studies examining the relationship between cognitive flexibility and food craving. In addition, no study was found that investigates the predictive power of social appearance anxiety and cognitive flexibility on food craving. In the studies to be conducted on the subject, different variables and sample groups can be studied. It can also guide in coping with food craving and determining the negative factors that have an effect on this situation. There is a need for causal studies on the subject. Education on eating disorders can be given to individuals in the emerging adulthood period, which is the age group where eating disorders and social appearance anxiety are most common. In addition, cognitive behavioral-based individual and group psychological counseling can be provided for individuals in emerging adulthood who have problems with eating disorders, cognitive flexibility and social appearance anxiety.

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Investigation of the Opinions of Drama Leaders on Drama Education and Activities

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Article Info	ABSTRACT
	This study aimed at determining the opinions of drama leaders, who practiced with preschool-age groups in the field of drama, about drama activities and education. In line with this purpose, the opinions of drama leaders on the concept of drama, the learning outcomes of drama activities on children, the approaches of parents to drama, and the problems or difficulties experienced by leaders in drama education were determined. This study was carried out as a case study, one of the qualitative research methods, by taking the opinions of 27 leaders who provided drama education to preschool children within the framework of formal or non-formal education institutions in İstanbul, Turkey. A semi-structured interview form prepared by the researchers was used as a data collection tool. As a result of this study, 4 different themes regarding the perspectives of the leaders on the concept of drama, 4 different themes regarding the opinions on drama and education, 4 different themes regarding the learning outcomes that the drama observed by the leaders for the children, 4 different themes regarding the learning outcomes that the drama should provide to the children, 4 different themes regarding the perspectives of parents on the concept of drama, and 5 different themes regarding the difficulties of drama were revealed.

INTRODUCTION

In the preschool period, one of the important developmental stages of the individual, the quality of the education that children will go through and the healthy design of the stimuli around them are very effective in their learning and development processes (Bulut, 2020; Durmuşoğlu-Saltalı, 2021; Gülay-Ogelman et al., 2021). One of the most effective methods that play a role in the education and training of children, helps them discover their development, and structures their behaviors is drama (Clement, 2021).

Drama is the animations made in play-like processes by making sense of a situation, event, idea, abstract, or concrete concept by using theatrical art techniques such as role-playing, improvisation, and animation (Adıgüzel, 2014). Therefore, drama provides active use of the senses. In other words, the learners learn through dialogue, movement, sound, and sight. Dialogue, role-playing, and kinesthetic movements appeal to verbal-linguistic, spatial, bodily-kinesthetic, interpersonal, and intrapersonal styles. As there can be children who learn in different ways in the classroom, drama can appeal to all children learning with these different styles (Tate, 2002). Many studies in the field of drama demonstrated that drama had a great effect on developing cognitive skills (Furman, 2000). In addition to this, in a study conducted by Ong et al. (2020) on the learning outcomes of drama on children, it was determined that promising results were achieved in children's social skills, expression, and communication skills, the tendency to teamwork, and critical and creative thinking skills.

Creative drama includes improvisation, movement, and rhythm studies. Considering that drama is not based on written text, its basic technique is improvisation (Sezgin, 2015). It is created spontaneously rather than by rote or script, allowing participants to express themselves as they are. Students in the classroom can act out a story they have learned before, and this improvisation process allows them to further analyze and synthesize the information they have learned. It contributes to their meaningful learning (Arieli, 2007; Guli, 2004). Another technique that exists at the heart of the drama is pretend play. Pretend play is being able to create fiction such as "if there was, if it were me, and as if it were ..." in the animations based on the real world (Körükçü, 2015, p:16).

According to Yavuzer (2003), considering that early childhood education has a long-term effect on individuals, the quality of the education received in this period is important. According to the study findings of Bloom (1964), half of people's mental development occurs between the ages of 0-4 and the remaining half continues up to the age of 17. 33% of all academic success of the child until the age of 18 is associated with success at the age of 0-6 (Fidan and Erden 2002). In addition to academic success, it is known that social-emotional learning outcomes acquired in early childhood also shape beliefs, value judgments, personality structure, habits, and attitudes in adulthood (Oktay, 2003). As a result, it is reported that the early childhood period is extremely important in the development of intelligence, social skills, and personality (Yavuzer, 2003). It is also reported that supporting the child in a healthy and qualified manner suitable for his/her development also has a positive effect on children (Ekinci-Vural and Kocabaş, 2016).

Acquiring some positive learning outcomes is aimed in children receiving drama education. Akyol (2003) expressed some of these achievements as follows: "The ability to work in a group is the development of creative thinking, understanding oneself and others, verbal and physical communication, solidarity, sharing, and problem-solving skills. The development of self-expression skills is being sensitive to the environment, being self-confident, gaining a sense of responsibility, decision-making and encouraging, internal discipline, being tolerant, and democratizing." According to the results of many practices and studies, the use of creative drama in education reveals that it is a more efficient educational process than traditional methods and clearly points out the importance of the contribution of drama to different development areas (Guli et al., 2013; Lee et al., 2013, Toivanen et al., 2012; Walker et al., 2011). It is seen that children are more successful in understanding and conveying what they understand (Aytaş, 2013). In addition to this, studies demonstrate that drama can be effective in eliminating developmental delays in social and language skills (Meyer, 1993). The results of using creative drama in learning environments can be beneficial as students who behave in a shy, quiet, or conscious way usually regain their confidence after learning to use their unlimited imagination (Ulubey and Toraman, 2015). For these reasons, drama emerges as an important element of the educational process.

It is considered that three important elements are fundamental in education. The leader or teacher who will be the source in transmitting the data, the students who will receive the data, and the school serving as a physical environment that enables this transfer to occur. A leader is a competent person with the necessary knowledge and equipment (Genç 2010). In a well-mediated and well-organized drama, adult direction, namely the leader, is indispensable since the natural flow of the play is not disrupted (Furman, 2000). The leader is expected to approach the group sincerely, handle different events and situations in a multi-faceted manner, and activate the participant in line with the goals (Bakan, 2009). Apart from these, it is possible for drama leaders to influence the behavior and attitudes of the group, and to be influenced when affecting the group (Lunenburg and Ornstein, 2013). Therefore, the personality (emotional maturity, stress management, and self-confidence), skills (technical and conceptual), and motivation (confidence, demands, and needs) of the leader are important characteristics that affect the quality of being a leader (Wayne and Cecil, 2012). Apart from this, drama leaders have basic duties such as activating the artistic and aesthetic feelings of children, enabling them to produce creative solutions to problem situations, preparing children for different events and situations, helping them to recognize various social roles, and enabling them to find connections between the inner and outer (Jennings, 2017). Drama leaders have a special education for drama, even if they have expertise in different fields, and can make practices in line with goals and objectives (Adıgüzel, 2014). Training or leadership is frequently associated with organizing the activities of participants and guiding the social process enabling them to regulate the way they handle events, goals, choices, individual motivations and abilities, prominent aspects, and common aspects internally and externally (Hoy and Miskel, 2010).

Considering the studies on drama leaders in preschool, it is seen that there are limited studies on drama leaders and leadership in Turkey. Güven (2001) discussed the opinions of parents, teachers, and drama leaders about drama and concluded that the age of the leaders, the number of children in the classroom, the field of education, and the duration of work did not affect their opinions on drama. Koçyiğit (2017) investigated the profiles and opinions of drama leaders in assessment and evaluation and concluded that drama leaders were not sufficient in using assessment tools. In a study conducted by Oğuz (2014), it was concluded that drama leaders should have drama knowledge, be creative, have advanced language and communication skills, empathize, and be tolerant and energetic. Kara (2014) conducted a study on leadership in Turkey and revealed that Turkish teachers were inadequate in functionally using drama. The most recent study including the drama leaders but was not directly focused on drama was conducted by Gök (2021). In her master's thesis, Gök (2021) analyzed learning with voice emotion in drama leaders, hearing-impaired individuals, normal-hearing individuals, and individuals with an autism spectrum disorder. In the international literature on drama leaders, there is a study about a theater professor and drama leader, Philip Michael Taylor (Hatton, 2020). It was considered that there was a need for a study on this subject due to the limited number of studies addressing the perspectives of drama leaders working with preschool children, the development, and achievements of children from their perspective, and the problems they experienced.

In this regard, this study was conducted to determine the opinions of drama leaders on drama education processes and drama activities. The following questions were adopted:

- What are the opinions of drama leaders on the concept of drama?
- What are the opinions of drama leaders on the relationship between drama and education?
- What are the opinions of drama leaders on the drama learning outcomes they observe in children?
- What are the opinions of drama leaders on other learning outcomes that drama is expected to provide to the child?
- According to drama leaders, what are the opinions of parents on drama education?
- What are the opinions of drama leaders on the difficulties they face in the education process?

METHOD

This section includes information on the design of the study, the participants, the data collection tool, the data collection process and analysis.

Research Model

This study was conducted with the case study pattern as it aimed at investigating the opinions of drama leaders on drama education and activities. Considering the studies conducted in Turkey, the case study (Yıldırım and Şimşek, 2006), also known as 'case', and 'special case', is a detailed analysis and description of a limited system by using data collection tools such as observation, interview, document, and report (Merriam, 2013).

Participants

The participants of this study consisted of 27 drama leaders in the İstanbul province of Turkey. The participants in this study were determined by the criterion-based purposive sampling method. The inclusion criteria were as follows: having worked or working with children in the preschool education period. Depending on the purpose of the study, this method allows in-depth research by selecting information-rich situations (Büyüköztürk, et al. 2012).

The demographic information of the participants was presented in Table 1.

Table 1. *The demographic information of the participants*

CHARACTERISTICS		N	%
Age	31-35 years old	8	29.6
	36-40 years old	7	26
	25-30 years old	5	18.5
	46 years old and above	5	18.5
	41-45 years old	2	7.4
Gender	Female	15	55.6
	Male	12	44.4
Educational Background	Bachelor's Degree	19	70.4
	Associate degree	4	14.8
	Postgraduate	4	14.8

As seen in Table 1, the entire sample group participating in this study consisted of 27 drama leaders (15 female leaders and 12 male leaders) working in various educational institutions. 8 of the participants were 31-35 years old, 7 of the participants were 36-40 years old, 5 of the participants were 25-30 years old, 5 of the participants were 46 years old and above, and 2 of the participants were 41-45 years old. 19 of the drama leaders had a bachelor's degree, 4 had an associate degree, and 4 had a postgraduate degree.

Table 2. *Information on drama education of drama leaders*

CHARACTERISTICS		N	%
Professional life other than drama teaching	Available	24	89.9
	Unavailable	3	11.1
Years of serving as a drama leader	1-5 years	13	48.1
	6-10 years	9	33.3
	11-30 years	5	18.5
Receiving a special education in drama training	Available	21	77.8
	Unavailable	6	22.2
Duration of the education received in drama training	1-3 years	15	55.65
	3-5 years	8	29.6
	0-11 months	4	14.8
Status of obtaining a certificate at the end of the training	Certificate	16	59.3
	Unavailable	8	29.6
	Certificate of participation	3	11.1
Qualification for the certificate to become a drama leader	Adequate	15	55.6
	Inadequate	12	44.4
Institutions providing drama education	Private	15	55.6
	State	9	33.3
	Both	3	11.1

As seen in Table 2, 24 of the participants in the sample group had a profession other than drama teaching while 3 of the participants were only working as drama leaders. Considering the experience of the participants in drama teaching, 13 of the participants served as a drama leader between 1 and 5 years, 9 of the participants served as a drama leader between 6 and 10 years, and 5 of the participants served as a drama leader between 11 and 30 years. While 21 of the participants had a special education in drama teaching, 6 of the participants did not have a special education in drama teaching (as they graduated from the conservatory theater department). They were among the 8 participants who received drama training for 3-5 years and did not receive a certificate or certificate of participation. Although 15 of the participants continued their training for 1 to 3 years and 4 of the participants continued their training for 0-11 months, 16 of the participants received a certificate and 3 of the participants received a certificate of participation. Although 15 of the participants found the training or certificates, they received sufficient, 12 of the participants did not find the training or certificates sufficient. 15 of the participants in the sample group worked in private institutions and 9 of them worked in public institutions. 3 leaders were working in both types of institutions.

Data Collection Tools

The research data were collected with the personal information form and interview form prepared by the researchers. The personal information form included questions about the participant's age, gender, educational status, duration of drama teaching, whether he/she was engaged in any other profession other than drama teaching, the age groups he/she worked for, whether he/she had special training in drama teaching (duration of the training, where it was received, whether it was sufficient, and whether he/she received a certificate or not), and the type of institution he/she was currently working in.

Open-ended questions were included in the form prepared to reveal the opinions of drama leaders on drama education and activities. These questions were used to evaluate what the concept of drama meant for drama leaders, the relationship between drama and education, drama education and activities, the development they observed in children, what else drama could bring to the child, the perspectives of parents on drama, and the difficulties they encountered during the education process. The interview form, which was prepared in line with the aim of the study and included 7 questions, was presented to 3 lecturers (drama education specialists) for their opinions. In light of the feedback from the experts, two questions were removed from the form and the final version of the form consisted of 5 questions and a personal information form. To understand the understandability level of the questions, a pilot study was conducted with 3 drama leaders. As a result of the pilot application, it was concluded that the questionnaire was understandable by the drama leaders and the final form was applied to all participants.

Data Collection and Analysis

A Google form containing the research questions was created by the researchers. The Google questionnaire was presented to the participants online and volunteer drama leaders filled out the form. Therefore, the responses provided by the participants were collected by the researchers in the computer environment. The data were analyzed by content analysis. The analyzed data were read by the researchers and the codes were determined. Then, related codes were brought together, and themes were obtained. Interpretations were made by including the codes and themes reached when presenting the data in tables.

To determine the consistency of the codes created by the researchers, Miles and Huberman's (1994) percentage of consensus calculation was preferred (Reliability formula: Consensus/consensus + division). According to Miles and Huberman, the reliability is expected to be over 80%. It was determined that the percentage of consensus in this study was over 90% for all questions.

In addition to these, the opinions of the participants were presented as direct quotations to support the reliability of the study.

FINDINGS

In this section, the analysis of the responses provided by 27 drama leaders to the questions in categories

such as the concept of drama, the relationship between the concept of drama and education, the observed and expected learning outcomes of drama on children, the perspectives of parents towards drama education, and the difficulties experienced by the leaders were emphasized.

The opinions of the drama leaders participating in this study on the concept of drama were presented in Table 3.

Table 3: *The opinions of the drama leaders on the concept of drama*

Themes	Codes	N
Education and Training Method	Self-confidence and social learning tool (L1), Learning through play (L2, L7, L16), Teaching method (L5, L26), Permanent teaching method (L11), Learning through experience (L13, L22)	9
Life	Making sense of life (L12, L25) Understanding, questioning, and interpreting life (L14), Life itself (L19, L27), Arousing feelings lost in life (L20), Experiencing life (L21, L24)	8
Art and creativity	The art of playing (L3), Animations developing imagination (L4, L17), Creativity and self-confidence (L6, L23), Play-based creativity process (L9, L10), An art form of narrative supporting development (L18)	8
Socialization	Communicating, socializing (L8), Social tool and sharing (L15)	3

9 out of 27 drama leaders participating in this study expressed their opinions about drama as an educational method. These participants reported that there was a play-based (n=3) teaching method (n=2) and that learning was permanent (n=2) as a result of learning through experience (n=2). In addition to this, they reported that it was possible to gain the necessary self-confidence (n=1) to play an active role in education and training life.

Some of the expressions of the drama leaders associating the concept of drama with education were as follows:

L7: *"It is an educational model that provides the flow of information by children's making drama (animation) while playing, accompanied by a leader…"*

L2: *"Drama is learning through play. I observed that individuals who continued their drama education continuously were more productive when they taught in other fields."*

L16: *"Drama is one of the training based on learning through play and plays the most important role in recognizing oneself against the memorization system"*

As seen in Table 3, some of the drama leaders explained drama by associating it with life (n=8). It was determined that the number of leaders defining the concept of drama as life itself (n=2), making sense of life (n=2), experiencing (n=2), understanding, questioning, and interpreting life (n=1), and arousing feelings lost in life (n=1) were higher compared to the total number of participants.

Some of the expressions of the drama leaders who reported that the drama was life itself were as follows:

L14: *"It is perceiving life, learning, surviving, interpreting and questioning…"*

L20: *"It can be said that drama is one of how the human community, who has partially lost the instinct to feel, regains this ability."*

L12: *"Making sense of life and making it understandable and expressing it by thinking and assimilating*

both individually and as a group."

The number of expressions including "creativity and art theme" was also quite high compared to the total number of participants (n=8). In addition to the drama leaders who reported that drama developed play-based (n=2) creativity and self-confidence (n=2) by supporting imagination (n=2), there were drama leaders who reported that drama was an art of playing (n=1) and a narrative art played only by professional actors (n=1). In this regard, some of the expressions were as follows:

L6: "Courage to create, self-confidence, self-discovery, and intellectual equipment…"

L10: "Drama is playtime. It is the whole of actions where children or adults enjoy playing, discover different ways of expressing themselves and their feelings, and experience the courage and enthusiasm of creating…"

L18: "Drama is a type of narrative played by actors and supports both mental and physical development."

Besides the themes of education, creativity, and life, there were also drama leaders regarding drama as a means of socialization and development of social skills (n=2). Some of the expressions of the drama leaders were as follows:

L8: "It is a tool that enables children to establish a comfortable relationship through various plays and to be a group without losing their characteristics."

L15: "It is a tool that improves the socialization of people of all ages, the development of perception, and the ability to do shared work together by using the tools of theater education."

The titles containing the opinions of the drama leaders regarding the relationship between the concept of drama and education were presented in Table 4.

Table 4: *The opinions of drama leaders on the relationship between drama and education*

Themes	Codes	N
Collaborative and hands-on learning	Learning through sharing and socializing (L1, L6, L15, L17),	14
	Learning through hands-on and experience (L3, L13, L14, L19, L20, L21, L22, L24, L25, L27)	
Permanency in learning	Efficient and effective learning (L2, L4, L8, L11, L16),	9
	Permanence of learned concepts or behaviors (L9, L10, L22, L23)	
Education and training method (tool)	Teaching method (L5, L26),	4
	Access to information (L7),	
	The basis of education (L12)	

As seen in Table 4, all the drama leaders participating in this study reported their opinions on the relationship between the concept of drama and education in a positive way. The participants expressed their opinions by considering the relationship between drama and education from three different perspectives as collaborative and learning through experience (n=14), permanence in learning (n=9), and education-training tools. Considering collaborative and hands-on learning, the expressions advocating learning by socializing and sharing (n=4), and hands-on learning and learning through experience (n=10) were in the majority. The opinions on the collaborative and learning through experience theme of drama were as follows:

L1: "I think it is an educational process that develops self-confidence and adapts to a social environment."

L25: "…When drama is used in education, we can say that students gain experience on a fictional plane before going into real life and become more ready for life. When real life becomes familiar, individuals who are more self-confident and able to find solutions to the problems they encounter will be raised."

Another emerging theme regarding the relationship between drama and education was permanence in learning. Some of the opinions expressed in the direction that the education provided with the drama method prepared a more effective and productive learning environment (n=5) and ensured the permanence of the learned concepts and/or behaviors (n=4) were as follows:

L9: "Drama is a play-based creativity journey where children gain experience through hands-on activities. I think teaching with the drama method serves as a tool that makes the things learned more permanent and enjoyable."

L11: "The relationship between education and drama is to create a more effective way of learning through hands-on learning and to build a solid bridge between…"

L22 argued that drama was a collaborative and hands-on learning process and explained the permanence of learning as a result as follows: *"Drama helps permanent learning as it provides learning through experience."*

As seen in Table 2, some of the drama leaders (n=4) regarded drama as a method (tool) of direct education. Some of the expressions associated with the teaching method (n=2), means of accessing information (n=1), and the basis of education (n=1) were as follows:

L5: "Creative drama is a teaching method."

L7: "It is an educational model that provides the transfer of information by children's making drama (animation) while playing, accompanied by a leader…"

L26: "I use it as a method."

Based on the learning permanence effect of drama, there were also opinions arguing that it was an educational method (tool). In this regard, L23 expressed his/her opinions as follows: *"Drama is a method that creates opportunities for participants to learn through hands-on activities and experiencing by using all kinds of educational/training materials, leaves permanent traces through experiences and animations, and develops individual's self-confidence, creativity, responsibility, cooperation, and communication skills."*

The opinions of drama leaders on the drama learning outcomes they observed in children were presented in Table 5.

Table 5: *The opinions of drama leaders on the drama learning outcomes they observed in children*

Themes	Codes	N
Social and Emotional Development	Self-confidence development (L1, L4, L6, L7, L11, L15, L16, L22, L26, L27), Socialization (L4, L9, L12, L16, L19, L24) Cooperation and adapting to the team (L16, L23, L25, L26), Empathy, tolerance, and sharing (L8, L9, L22, L23) Happiness (L10, L19, L20), Problem-solving skill (L11, L12)	19
Language and Communication Skills	Verbal expression skills (L2, L4, L6, L8, L11, L17, L22, L23, L24, L25, L27), Communication (L4, L7, L8, L9, L12, L15, L19) Articulation (L2)	16
Cognitive development	Creativity and imagination (L3, L12, L13, L17, L18, L22, L27), Inquiry, observation, and inference (L7, L9), Quick and permanent learning (L5, L8), Learning with fun (L14, L21)	13
Physical development	Physical development and awareness (L7, L13, L18)	3

Considering the effect of drama on children in Table 5, most of the drama leaders observed and reported

that learning outcomes were achieved in the field of social and emotional development (n=19). Some of the drama leaders participating in this study reported that children developed to be self-confident (n=10), more extroverted and sociable (n=6), collaborative and adaptable within a group (n=4), empathetic, tolerant, and sharing (n=4). In addition to these, some of the drama leaders reported that drama made children happy (n=3) and increased problem-solving skills (n=2).

L9: "I observed an introverted child become an extrovert. I realized that socialization, sharing, and communication channels were opened more."

L10: "Based on what I observed during my teaching career, I can say that all children love drama. During my 10 years of experience, the number of children who say "I don't like this course" is one or two. That's why drama is a lesson where children are always happy, excited, and feel good. Another characteristic drawing my attention is that the children are very happy to be rewarded for what they do there at that moment."

L11: "They can develop thoughts and reflexes against different problem situations. I observed an increase in their self-expression skills and self-confidence. For example, I observed that one of my students clearly demonstrated improvement in terms of self-confidence, improvisation skills, problem-solving skills, and creativity for 4 years."

Another observed effect theme of drama on children was the development of language and communication. Drama leaders reported that when children received drama education, their verbal expressions became clearer and more understandable (n=11), and their communication with peers and adults improved (n=7). In addition to these, there was also a drama leader who observed improvement in articulation (n=1). Some of the expressions of drama leaders observing developments in language and communication were as follows:

L2: "Better expression and better articulation…"

L17: "They express themselves better and understand the other better."

L24: "… I can say that it contributes to the individual in self-expression."

Almost half of the drama leaders (n=13) participating in this study observed that many cognitive learning outcomes were achieved in children receiving drama education. According to drama leaders, drama education had the most effect on children's creativity and imagination (n=7). In addition to these, observing, questioning, and making inferences (n=2), learning the concept or behavior to be acquired quickly and learning permanently (n=2), and learning with fun (n=2) were reported as the other effects of drama on cognitive processes. Some of the expressions were as follows:

L3: "Their imaginations are getting stronger."

L5: "Children can learn what they need to learn better, faster, and with pleasure through the creative drama method. In this case, children do not forget what they learn better, and they become more successful."

L7: "…It has a positive effect on the personal development process, such as making observations and making inferences."

L27: "Drama education enables children to reveal their creative potentials."

Some of the drama leaders (n=3) emphasized physical development. One of the leaders expressed his/her opinions on the learning outcomes in the field of physical development observed in children receiving drama education as follows:

L13: "It improves mobility both quantitatively and qualitatively."

The opinions of drama leaders on the other learning outcomes that drama was expected to provide to the child were presented in Table 6.

Table 6: *The opinions of drama leaders on the other learning outcomes that drama was expected to provide to the child*

Themes	Codes	N
Social and Emotional Development	Self-awareness (L3, L4, L14, L16, L17, L22, L23, L26), Social awareness (L6, L8, L10, L12, L22, L25), Being self-confident (L3, L5, L14, L16, L21, L24), Social relations and skills (L9, L10, L20, L21, L26), Empathy, respect, and feeling of love (L8, L10, L12, L15)	18
Cognitive development	Observing-listening-understanding/comprehension (L2, L7, L10, L11, L18), Academic success (L5, L9, L24), Creative thinking skill (L10, L18)	8
Language and Communication Skills	Verbal communication and expressiveness (L1, L10, L24, L26)	4
Holistic development	All development areas (L13, L19, L27)	3

As seen in Table 6, drama leaders expressed their opinions mostly in the field of social-emotional development about the expected learning outcomes of drama (n=18). The other learning outcomes that drama was expected to provide to the child were the development of self-awareness towards emotions, body, and skills, which was considered to offer important benefits in the way of being an individual (n=8), acquiring values with social awareness towards social events and situations (n=6), the increase in self-confidence (n=6), the improvement/development of social relations (n=5), and the increase in actions such as empathy, respect, love, and sharing (n=4). In this regard, some of the opinions of the drama leaders were as follows:

L4: "It can reveal characteristics in children that they and their parents are not even aware of."

L8: "It increases the ability to empathize. Understanding one's own value in the community of which he/she is a part and continuing as a part of this community without losing that value."

L14: "The fact of being an individual. Most importantly, it increases self-confidence."

L10: "… establishing cooperation, developing different perspectives, listening-understanding… etc. should be acquired."

L12: "Social awareness and empathy skill."

Beyond the observations of the drama leaders participating in this study, the participants believed drama education could also contribute to cognitive development. Considering cognitive development, drama leaders reported that observing, comprehending what one observed, understanding, and listening (n=5), academic success (n=3), and creative thinking skills (n=2) improved. Some of the opinions of the drama leaders expressing the expected contributions of drama in cognitive development were presented below.

L7: "Inference and observation are very important because if the child has fun just by playing, the knowledge remains passive. Knowledge alone does not mean anything. The inference and observation arising from the combination of the two will contribute to the child's mental world and thinking, and the first step of the individual process will be comprehension, understanding, listening, and thinking.

L9: "I think that drama will affect not only the social skills of children but also their educational life positively.

L18: "…it has a positive effect on their cognitive development by helping them beat their brains out."

Considering the language and communication skills in Table 4, it was argued that drama training (n=4) also contributed to verbal expression power and communication skills.

In this regard, L1 explained his/her opinions as follows: "I think his/her ability to express himself/herself improves." There were also drama leaders (n=3) arguing that drama provided children with a learning outcome in every field. L27: "Actually, all desired learning outcomes can be acquired through drama. It is important to set the target correctly."

The opinions of parents on drama education according to drama leaders were presented in Table 7.

Table 7: *The opinions of parents on drama education according to drama leaders*

Theme	Code	N
Developmental support	Effective and necessary in every way (L4, L5, L10, L14, L15, L18, L19, L21, L23, L26, L27)	17
	Social development (L6, L11, L25)	
	Academic success (L6, L10)	
	Considering it is necessary after the training (L2, L11, L24)	
	Talent development (L16)	
Method of passing time	Demonstration (L9, L22, L23)	5
	Entertainment and leisure time (L1, L20)	
Unconscious	Completely unconscious about drama (L7, L8, L12, L13)	4
Unnecessary	Considering drama unnecessary (L3, L17)	2

As seen in Table 7, the opinions of the parents on drama education were gathered under 4 themes according to the drama leaders. It was determined that there were parents thinking drama education provided developmental support to their children (n=17), some of the parents were aware of the necessity of drama education even though they were not interested in the content and learning outcomes (n=5), some of the parents were unconscious about the content and necessity of drama education (n=4), and some of the parents considered drama unnecessary (n=2).

Based on the knowledge and observations of the drama leaders participating in this study, most of the parents (n=11) whose children received drama education believed that their children had developed and/or would develop in every aspect and considered it necessary because they knew that drama education was effective. According to the drama leaders, in addition to the parents who considered drama education necessary for reasons such as socialization, widening the social environment (n=3), and affecting academic success (n=2), some parents who considered drama education unnecessary at the beginning but understood its necessity with the emergence of its effects and the achievement of the learning outcomes. In this regard, some of the expressions of the drama leaders were as follows:

L18: "I think that parents' thoughts about children's drama education are positive as it contributes to their socialization, cognitive development, and physical development."

L25: "Parents often say they want drama training for their socialization."

L10: "...Parents know and care about how beneficial drama education is for the development of their children and how beneficial it is to the academic process."

L2: "It was observed that parents considered drama education unnecessary at the beginning and encouraged the student after the education."

According to the drama leaders, there were parents (n=4) who confused drama education with theater and expected a show as well as parents (n=2) considering that drama was important in terms of creating a fun environment for children and spending their leisure time. The drama leaders used the following expressions about the theme of the drama's method of spending time:

L23: "We observe that parents are generally unaware of but have positive ideas about drama. Drama is often confused with theater."

L20: "Based on my observations, many parents may think that drama is a fun time for their children to spend because they consider drama education only as a means of entertainment and play."

According to drama leaders, some parents had no idea about drama education, its activities, and the effect and learning outcomes of drama (n=4). In this regard, some of the expressions of drama leaders were as follows: *L13: "Parents do not know these things, and they do not want to learn…"*

L17: "Most of the parents do not see it necessary..." The drama leaders also reported that there were parents who considered drama education unnecessary and negative (n=2).

The opinions of drama leaders about the difficulties they faced in the education process were presented in Table 8.

Table 8: *The opinions of drama leaders about the difficulties they faced in the education process*

Themes	Codes	N
Educational institution	The perspective of the educational institution administration on the drama lesson (L10, L12, L21, L25, L27), Physical conditions of the educational institution (L12, L23, L24)	8
Parents	Expectations of parents (L4, L6, L13), The perspective of parents on the drama lesson (L10, L15, L21)	7
Child	Communication with the child (L6, L8, L16, L18, L19), Child's attitude towards the lesson (L11, L14, L22)	7
None	Drama leaders who do not experience any problems (L1, L3, L5, L7, L9)	5
Other difficulties	Lack of personal knowledge and equipment (L26), Unfavorable economic conditions (L20), Insufficient leader training (L2)	3

As seen in Table 8, three themes emerged regarding the problems faced by the drama leaders: the educational institutions where drama lessons were provided (n=8), the parents of the children (n=7), and the children themselves (n=7). There were also drama leaders (n=5) who reported that they did not encounter any problems while providing drama education. It was reported that the problems faced by the drama leaders were due to their own lack of knowledge (n=1), poor economic conditions (n=1), and the lack of adequate congresses, seminars, and training of leaders in the field (n=1).

Considering the problems arising from the administration of the institution where drama education was provided, one of the problems experienced by the drama leaders was regarding drama education as "entertainment and show" and having expectations in this direction (n=5). In addition to these, physical conditions such as not allocating a special area for drama education, not providing the necessary equipment for the lesson, and the excess number of students (n=3) were among the other problems experienced within the institution. Some of the expressions related to the educational institution theme were as follows:

L21: "The institution that I am working with deems my profession as the art of theater and considers the drama lesson as a means of entertainment."

L12: "...I can do my lessons as I wish, but some made-to-order shows sometimes challenge the children and me. I also think that I am incomplete due to schools avoiding expenses in terms of using materials. More importantly, it bothers me to work in the same classroom environment rather than in a space designed for drama."

Another source of problems experienced by drama leaders was parents (n=7). The expectations of parents (n=4) such as wanting to see rapid development in their children after the drama lesson, expecting special treatment for their children, and wanting their children to be at the forefront of the shows (n=4) were among the problems experienced by the drama leaders. There were also parents such as institution administrators or teachers, who mistook drama for theater and regarded it as a means of play, entertainment, and leisure (n=3). Some of the opinions of drama leaders on the problems arising from the parents were as follows:

L4: "We often face difficulties from parents. They have different expectations because they do not know the difference between self-confidence and being spoiled, and they act hastily regarding the development of children."

L15: "Parents think that drama is just a game or entertainment and regard it as a means of getting rid of their children, even for a short time…"

As seen in Table 6, another problem theme reported by the drama leaders participating in this study was the children they provided drama education for (n=7). The process of active participation with children in the lesson, difficulty in orientation, the child's introversion, the child's mobility, and communication problems due to

not getting along with young people (n=4) as well as the necessity of academic success imposed on children, rote learning children who were focused on the result rather than the process and who cannot use their imagination (n=4) were other problems that made the drama education difficult. In this regard, some of the opinions of the drama leaders were as follows:

L11: "In some cases, I saw children who stopped daydreaming at an early age, and this disappointed me. I think that children should not try to approach drama with a rote learning perspective while still in kindergarten. This is both very upsetting and thought-provoking…"

L19: "Sometimes, students who can't concentrate on the lessons in younger age groups can be the children with whom I have communication difficulties."

One of the drama leaders, who mentioned he/she faced problems caused by children, expressed his/her opinions as follows: *L18: "I had a hyperactive student years ago. He/she was tiring me out. When I was confused about how to communicate, I learned how to use my energy correctly because of being hyperactive myself and being noticed by an instructor in time, and being directed to the theater. I approached him/her with all my empathy. Now, he/she is a drama leader."*

Some of the expressions of the drama leaders who reported that they did not have any problems with the education institution, parent, child, etc. in the drama lessons were as follows:

L3: "I did not encounter any problems. I don't have any problems; we are based on volunteering..."

DISCUSSION AND RECOMMENDATIONS

In this study, the opinions of drama leaders working with preschool children on the concept of drama, the relationship between drama and education, the observed and possible learning outcomes of drama, the opinions of parents on drama education from the eyes of drama leaders, and the difficulties experienced by drama leaders, if any, were determined. It was determined that drama leaders defined drama under the titles of education and teaching method, lifestyle, art and creativity, and socialization. In parallel with this study, there were other studies and definitions of researchers about drama in the related literature. Ülker-Erdem et al. (2017) determined that preschool teachers and teacher candidates defined drama as a method-technical drama, drama as a means of expression, drama as an opportunity for hands-on learning, drama as a type of activity, drama as a creative production process, and drama as a play. Similarly, Hornbrook (1998) concluded that drama formed a simple part of what we encountered in life. Based on hands-on learning, Chen (1997) reported that drama was the opposite of traditional education understanding and did not allow children to learn passively but required active participation in their own education. Chukwu-Okoronkwo (2011), on the other hand, emphasized that drama was "the process of developing and acquiring artistic skills" as an educational tool and asserted that "creative drama was a learning process". Lin (2010) and Tam (2016) reported that drama was one of the activities that children needed for creativity, and that the primary goal of drama was to develop creativity in children.

Another result that emerged in this study was that the participants established the relationship between drama and education as collaborative and hands-on learning, providing permanent learning, and being an education-teaching method. Aydın-Şengül (2016) reported that creative drama activities supported hands-on learning instead of rote learning, and Tombak (2014) reported that it was the most effective education and training method for the health of children involved in the process. McNaughton (2004) reported that the use of drama in education encouraged learning by rebuilding knowledge and facilitated learning and, therefore, emphasized the importance of drama in education for sustainability in education through experiential learning and imagination. As seen, drama leaders defined drama by making explanations in line with the theoretical knowledge studies in the literature and revealed the relationship between drama and education.

According to the drama leaders, the most observed learning outcomes in children were in the areas of social-emotional, language and communication, and cognitive and physical development, respectively. In addition to these, drama leaders expected the drama to provide children with learning outcomes in social-emotional areas, followed by language and communication, cognitive areas, and all development areas. Aydın-

Şengül (2016) emphasized the contribution of drama to emotional development and reported that the students who participated in the plays in which negative emotions such as anger, fear, and jealousy were involved learned where and how these emotions should be expressed correctly. Chukwu-Okoronkwo (2011), pointed out that children achieved similar learning outcomes through drama. The child can find himself/herself and explore his/her personality, potential and limitations, capacities for movement and language, and special interests through drama. He/she develops the ability to control her emotions, ideas, and thoughts, and learns to express and communicate his/her ideas orally, spontaneously, quickly, and adequately. According to Nurhasanah (2022), children's cognitive skills such as critical thinking and problem-solving and social skills such as communication with cooperation were supported by drama education. Çulha (2020) described the learning outcomes of drama in children as contributing to the development of creativity and imagination, contributing to the concept of 'self', independent thinking and decision making, awareness and expression of emotions, positive contribution to communication skills and language development, social sensitivity, and cooperation and working together. Drama leaders also reported that they observed the possible outcomes of drama in children in line with their own practices. This result can be interpreted as drama leaders making practices to support all developmental areas of children.

According to the drama leaders, parents mostly provided their children with drama education as it supported their development. However, according to drama leaders, some parents provided their children with drama education because it helped their children to make use of their spare time. In addition to this, there were unconscious parents who received drama education but were not aware of the contribution of drama to their children. Some of the parents, although only a few, considered drama education unnecessary even if their children received drama education. In a drama-based study conducted by Tan (2020) with mothers and their children, some of the mothers reported that drama supported the development of children in many areas in relation to socialization and increasing self-confidence. Lindberg (2015), who considered that the parents regarded drama as spending spare time or not necessary did not recognize the concept of drama or did not have a good understanding of it, expressed this situation as one of the obstacles to drama education.

The last result of this study was that drama leaders reported the difficulties they experienced in the education process as difficulties arising from the educational institution, parents, and the child, respectively. In addition to this, issues such as lack of sufficient knowledge, education and experience in drama, and wages were the difficulties experienced by drama leaders. Güngör and Ateş (2019) reported that children who initially exhibited an introverted and abstaining attitude and, therefore, had difficulty in communicating, demonstrated positive developments thanks to drama education. In this regard, the results of this study were in parallel. Kulik (2004) conducted a study and determined that children who received drama education made friends more easily over time, expressed their feelings more easily, and therefore, there was an improvement in the difficulties arising from communication problems. Another difficulty reported by the drama leaders was the lack of special spaces needed for drama education. Bütün et al. (2015) reported that they had difficulty with physical space, time, and the school administration's negative attitude towards drama-oriented studies. Selvi (1999) reported that the most basic problems in drama education in schools were resistance to drama education due to the insufficient knowledge of the school administration, overcrowded classes, insufficient skills and knowledge of the drama leaders, and the conditions of the physical space. Lindberg (2015), who conducted a learning-focused study with the preschool drama curriculum, suggested that apart from parents, school administration and teachers were not familiar with the concept of drama and, therefore, drama leaders, teachers, school administrators, and parents should be educated about the use of theatrical methods by providing training sessions. In addition to these, although the drama leaders reported the difficulty of the number of children receiving drama education, the physical facilities of the place, and the duration of the education, Güven (2001) revealed that these difficult conditions did not affect the perspective and attitude towards drama on both the drama leaders, the children, and the parents. It was determined that there was not much differentiation in the factors that compel the drama process for leaders in different studies conducted in different years.

This study had some limitations. Only drama leaders working in the İstanbul province of Turkey were included in this study. There is a need for studies involving drama leaders working with different age groups in

different provinces. Therefore, it can be suggested that similar studies can be designed and applied in different provinces. Accordingly, obtained results can be compared. Considering the learning outcomes of drama education in preschool children, it is considered important to increase preschool teachers' competencies in drama planning, implementation, and evaluation. In this regard, it can be ensured that the classes in the undergraduate programs are conducted by drama experts as much as possible, and teachers can be supported on drama through in-service training. According to the result that about half of the drama leaders received drama education for the preschool period and most of them were engaged in other professions, it can be suggested that the education of leaders should be increased, and drama education should be provided by the drama leaders. To reduce the obstacles experienced by drama leaders due to parents and school administration, drama programs can be prepared and applied with the participation of parents and administrators. This way, a considerable amount of contribution can be made to increase the awareness of parents and administrators about the importance and necessity of drama. Based on the limitations of the studies conducted with drama leaders in the literature review, it is recommended to conduct studies on the competence of drama leaders and their education, increase the number of projects related to drama education, and integrate qualitative, quantitative, mixed, and meta-studies in all these studies and projects.

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GENOGRAM: EXAMINATION of THREE GENERATIONS of CEVDET BEY ve OĞULLARI

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Article Info	ABSTRACT
	In this study, we aimed to reveal the genogram diagram in the novel "Cevdet Bey ve Oğulları." Representation of individuals with at least three generations of age, gender, and marital ties, as well as moods, dependencies, and methods of coping with stress genogram revealed many factors, such as individual and family-based therapies are used. The genogram maps of Cevdet Bey, Refik, and Ahmet, who are included in the book, and represent three generations, could be examined by extracting them. Not only can the physical characteristics of the characters, but also the relationship between them, communication, decoupling, addiction, etc., be examined in the novel. Although the names and upbringing styles of the characters may change, it can be determined in the work that the toxic events that cannot be solved in the family are repeated. With the help of the study, it was revealed that the novel "Cevdet Bey ve Oğulları", Orhan Pamuk's first book which also won two awards, has a separate place in literary works in terms of studying the genogram from all angles.

INTRODUCTION

A genogram (Papadoupoulos et al., 1997), which is one of the techniques that Bowen family system theory frequently uses in couple and individual therapies, especially family therapies, in order to map the connections of individuals with the past (Gladding, 2014; Dunn & Levitt, 2000; Tessina, 2003) is defined as a map of the systems of relationships. The genogram, which represents at least three generational processes and structures of the family (Carlson, et al., 2005; Dunn & Levitt, 2000), allows counselors to examine the emotional processes of the family, the tides and flows between individuals in intergenerational contexts (Goldenberg & Goldenberg, 2007).

The genogram created to obtain information about the formation of the family and relationship dynamics (Papadoupoulos, Bor & Stanion, 1997) and to form hypotheses with this information (Dunn & Levitt, 2000; Goldenberg & Goldenberg, 2007) is compared to a meatless skeleton by some researchers (Wacthel, 1982). Genogram, which aims to obtain information about the history of the family, its patterns (Tessina, 2003), how it came to where it is today (Carlson, Sperry & Lewis, 2005), what the recurring patterns are in the family process (Papadoupoulos, Bor & Stanion, 1997) and the psychosocial structure of each individual, is used by experts for evaluation and treatment when working with couples and families. (Foster, et al., 2002). Based on this sentence, the genogram aims to help define the role played by the individual in the family system (Goldenberg & Goldenberg, 2007).
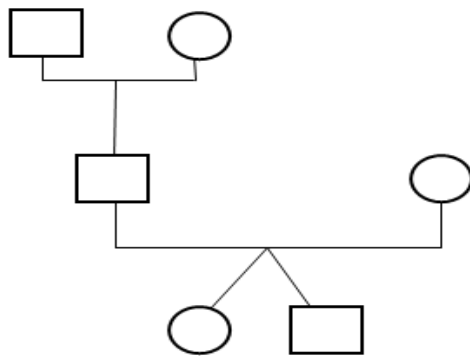

Figure 1: Three-generation Genogram Model (McGoldrick, 2016).

When the above table is examined, it is seen that the square symbol represents men and the circle symbol represents women. The ages of individuals can be written in the center of the symbols. While the partners are written in the genogram, the men are written to the left, and the wives are written to the right of the partners. A similar situation applies to children. According to this, the oldest child is written starting from the left, and the next children are written moving to the right. The genogram, which is considered as an X-ray scan of the family (Gladding, 2014), also includes important information such as individuals' names, ages, marital status, divorce, separation without divorce, and date of death (Carlson, et al., 2005). In the genogram, if the person making these drawings is female, they are circled twice, and if it is male, they are squared twice (Goldenberg & Goldenberg, 2007). The type of genogram to be used may differ from the standard genogram, depending on the characteristics of the group (Fredman & Krauker, 1992). For example, a genogram can be created by choosing the color red for conflict and green for alcohol addiction (Işık, 2008).
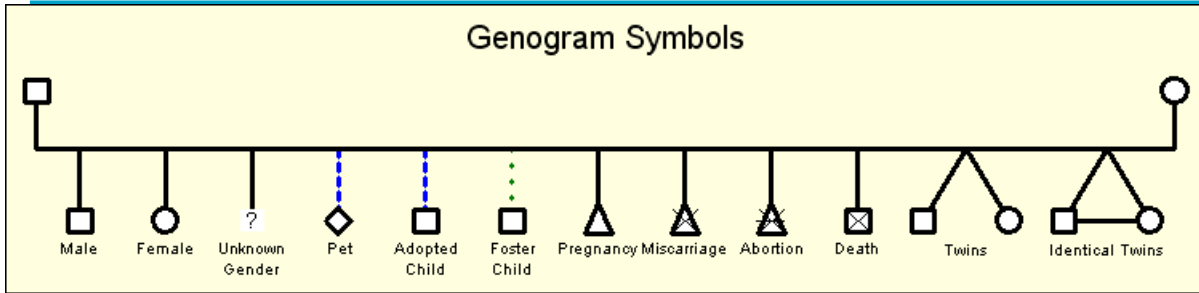
Figure 2: Standard Genogram Models (McGoldrick, et al., 2008).

Based on the table examined above, the genogram is interpreted as a question mark instead of a symbol for babies of unknown gender, an argyle symbol at the end of the dashed blue line for s pet, a square symbol at the end of the dashed blue line for the adopted child, a square symbol at the end of the dashed green line for the foster child, triangle symbol for pregnancy, the diagonal cross drawn on top of the triangle for abortion, multiple crosses on the triangle for abortion, cross on the square for the death of both genders, triangle and square symbols jutting from a single line end for twins, and finally, squares jutting from a single point and connecting to each other from below for identical twins. As for the meanings of the lines between the couples; marriage is shown with one straight line, separation with one curved line on the straight line, and divorce with two curved lines on the straight line (McGoldrick, et al., 2008).
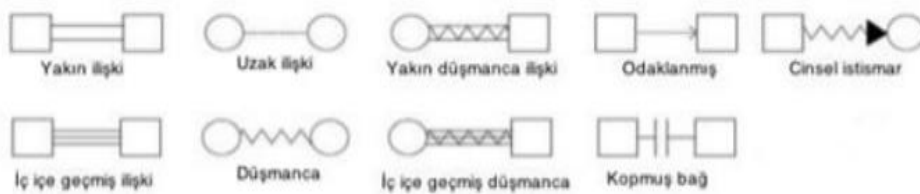
Close/Distant/Close-Hostile/Focused on/Sexual Abuse/Fused/Hostile/Fused Hostile/Cutoff

Figure 3: Symbols of Interpersonal Relations in Generations (McGoldrick, et al., 2008)

In addition to basic information such as the age and gender of individuals, information about whether their relationships are close, distant, hostile, fused, or cutoff is obtained by means of the genogram. Genogram, which is accepted as an evaluation and treatment tool (Foster, et al., 2002), has started to be used by adding photographs to increase the quality (Cook & Poulsen, 2011). Thanks to the use of photography, richer genograms have begun to be obtained in terms of information and experimentation.

In consultations, in the process of having individuals draw a genogram, focusing on how individuals perceive events rather than who is right and who is wrong (Cook & Poulsen, 2011), it is ensured that the favorite features are highlighted and the genogram is re-examined after a certain time. In this way, as a result of genogram analysis, it becomes easier to understand how the situations in the family affect the individual and others around him (Tessina, 2003). There are also different types of genograms for use in many different fields. These can be cultural genogram (Marchetti & Cleaver, 2000), ethnic genogram (Zynga, 2012), art genogram (Mitrofan & Petre, 2012), ethical genogram (Pelusa, 2006), critical genogram (Kasutic et al., 2009), gender-related, solution centered, and religious belief-based genograms (Işık, et al., 2012).

Important formations of genogram drawing are useful in obtaining information about the formation of the family and relationships within the family (Stranion & Papadoupoulos, 1997), awareness for both family members and the individual (Arkar & Şafak, 2013), confrontation about repetitive and interconnected events in relationships (Foster, et al., 2002), understanding psychological-emotional patterns, recognizing possible triangulation tendencies (Kesici, 2015), and accessing concrete data about the family in a short time (McGoldrick, et al., 1999). Reaching these important formations in consultations became easier with the use of genograms (Jolly, et al., 1980). While some counselors take a genogram in the first session, some prefer to complete the drawing in the first session and talk about it after a certain period (Tessina, 2003), while others prefer to make up-to-date speeches in their sessions by taking part in the genogram in each session (Wacthel, 1982). All three types can be used. Here, it should be noted that the counselor should take a separate genogram from each individual in order to better understand the connections between past experiences and current beliefs (Kesici et al., 2015).

According to the findings, it has been determined that individuals show less resistance in the genogram because they are in a structured inquiry process (Wacthel, 1980). After the completion of the genogram, ideas are formed about how the twists, toxic events, and positive or negative characteristics in the family come to the individual and affect the individual (Tessina, 2003; Guerin, & Pendagast, 1976; Marchetti-Mercer & Cleaver, 2000). In fact, the genogram gives hints to counselors about the generation's ways of coping with stress (such as drug use, withdrawal, addiction, religion, diseases, and being a workaholic) (Kesici et al., 2015). Genograms, which provide information about the individual in many areas, can also appear in literature as well as it is used in many fields such as family counseling, individual counseling, medicine, career counseling, spiritual counseling, social work, and education. Although literature and psychology seem to be two separate fields, both have a common point of focusing on human behavior (Atlı, 2012). In fact, it is thought that literature is the field that is the most closely related to psychology and human among the sciences (Taşdelen, 2015). In this field, in Cevdet Bey and ve Oğulları, Orhan Pamuk's first novel which won both the Orhan Kemal Novel Award and Milliyet Novel Award, the social, economic, and cultural situation of a family for three generations is conveyed to the reader. In this way, it is noticed that toxic relationships, hostile attitudes, twist points, separations, cheatings, traumas, and deaths that have occurred over three generations are conveyed.

According to the book of Cevdet Bey and His Sons, the family genogram is seen as follows.
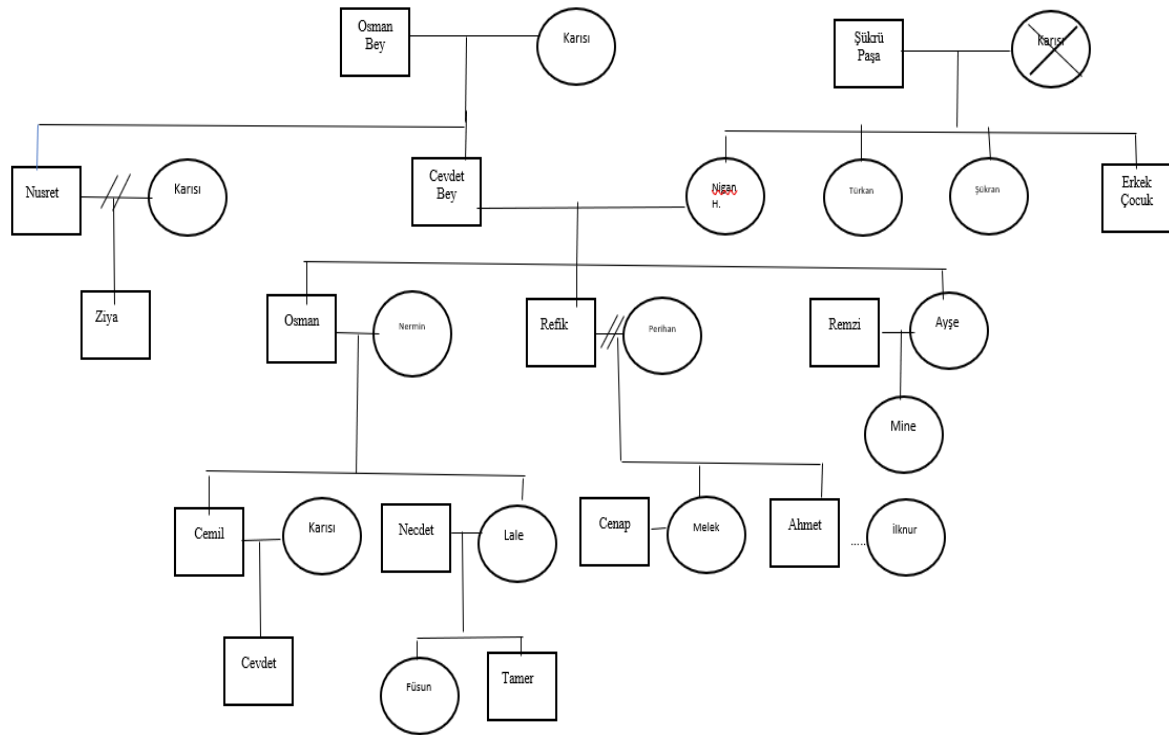
Figure 4: Genogram of Cevdet Bey and His Sons

The genogram representing at least three generations of a family and its structure (Carlson, et al., 2005; Dunn & Levitt, 2000) has been examined in the above table with the novel Cevdet Bey and His Sons. According to the genogram drawn, information can be obtained from three generations, starting from Osman Bey and his wife, to Cevdet, Tamer, and Füsun, who are the children of his last grandchild. It is concluded that Nusret is older than Cevdet or Osman is older than Refik and Ayşe, due to the rule of writing the older one to the left, which is one of the main features of the genogram technique. For individuals who have a partnership relationship between them, regardless of age, the male partner should be written on the left and the female partner on the right. The situation can be observed in the examples of Cevdet Bey and Nigan Hanım or Remzi and Ayşe. Again, as seen in the genogram, Nusret and his wife and Refik and Perihan ended their marriage with divorce. If individuals were separated without divorce, this separation would be represented by a single horizontal line, when separated by divorce, it was represented by two horizontal lines. At the end of the book, which took place between 1905 and 1970 in three different periods, almost all of the characters completed their lives and died. However, the individuals (Şükrü Pasha's wife) who died in the process are shown with a cross on the circle in the genogram. Based on the data on the genogram, Cevdet Bey has a brother. His father is Osman Bey, and his mother's name is not mentioned in the book. Cevdet Bey married Nigan Hanım and they had three children from this marriage. The children's names are Osman, Refik, and Ayşe. Cevdet Bey has five grandchildren; their names are Cemil, Lale, Melek, Ahmet, and Mine. The children of his grandchildren are three, and their names are Cevdet, Füsun, and Tamer. A similar genogram analysis can be drawn for Cevdet Bey's brother Nusret Bey.

When the relations within the genogram were examined, it was observed that there was a hostile relationship between Cevdet Bey and his brother Nusret. The relationship is shown in the table.
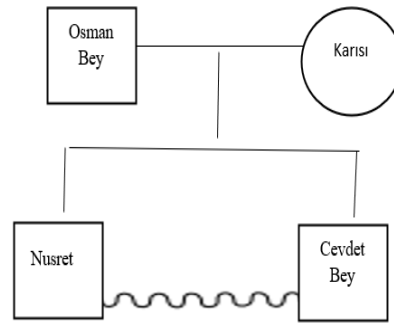
Figure 5: Relationship Genogram between Cevdet Bey and his brother Nusret

Based on the genogram analyzed above, it is understood that there is a hostile relationship between Cevdet Bey and his brother Nusret. Siblings living in different environments, having different financial expectations, one sibling taking full responsibility for the family and the other going abroad may have triggered the hostile relationship between them. This hostile relationship between siblings was also observed in siblings' children a generation later. When Ziya, the son of Nusret Bey, could not get what he thought he deserved from Cevdet Bey's sons, asked Cevdet Bey "…why, like Osman and Refik, I did not go to Galatasaray, I could have gone to a school where very polite people attended, but you preferred to send me to military school. Now this job is my last chance in life, so fulfill my wishes…" and demanded what he thought to be his right with a hostile attitude. These problems in the families were not easily resolved in the following processes.
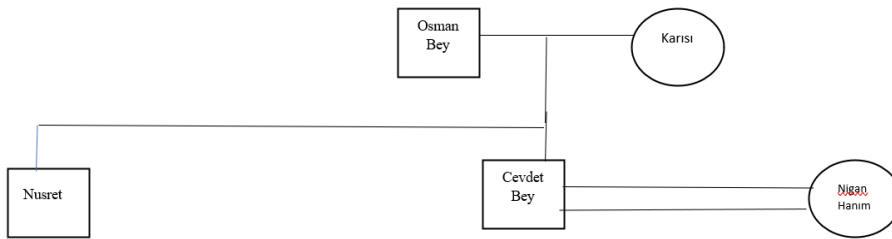

Figure 6: Close Relationship Genogram between Cevdet Bey and His Wife Nigan

In order to talk about the concept of the close relationship between individuals, it is expected that there should be sincerity and a deepening relationship between them (Tessina, 2002). As seen in Figure 6, the existence of intimacy based on communication between Cevdet Bey and his wife, Nigan Hanım, has been conveyed to the reader. From this point of view, it can be concluded that there is a close relationship between Cevdet Bey and Nigan Hanım. The close relationship between individuals is shown by two straight lines. In addition, it is conveyed in the novel that during the period when Cevdet Bey was doing business, trading Turks like him was a minority. Cevdet Bey, who was working at that time, thinks that work is very important in order to maintain his job, establish a home, and protect the health of the established home (Pamuk, 2002). Based on this thought, it can be thought that the meaning that Cevdet Bey attributes to the concept of family is the main reason for her respect and sincerity toward her partner.

In the novel, for generations when someone needed care, a man who has been at home supported her by staying with her. For example, Cevdet Bey stayed with his mother during her illness, Refik stayed with his

malnourished and weak sister Ayşe to support her care, and Ahmet stayed with his grandmother who was old and needed support. The relationship based on staying with the sick or the ones in need of care in the family progresses in the form of a twist throughout the generations. It can be thought that the death of Cevdet Bey's mother due to tuberculosis when he was young, and the death of his older brother due to tuberculosis while he was abroad, may have affected his feeling of being with family members who needed help. The fact that tuberculosis became a treatable disease over time and that no one in the family died from tuberculosis may have been a turning point for the family in terms of tuberculosis. But in the next generation, even the fact that Ayşe eats less food and has a low immunity has revealed that they have a more sensitive and overprotective attitude towards her due to previous tuberculosis-related events that have caused trauma in family members. The same situation manifested itself in the way Ahmet stayed with his grandmother.

Of the individuals included in the genogram, it is seen that Cevdet, Nusret, Ziya, Ahmet, Osman, and Refik have an alcohol addiction. Individuals who have a connection with alcohol can be indicated with a red line in genogram studies for different purposes (Işık, 2008). Based on the information, it can also be found that alcohol addiction is transmitted in a toxic way over generations.

It gives information about how families communicate with each other in the events hidden within families and about the boundaries they draw against each other. Nermin and Osman characters in the book are cheating on each other. Since Nermin's cheating would not be tolerated by society (Hendrick, 2016/2003), Refik did not inform anyone about the subject, even though he saw Nermin going in someone else's car. Although there are different findings about cheating rates according to gender in studies on cheating rates (Çıkıt, 2017; Weil, 1975), it is seen that first Osman and then Nermin started to exhibit cheating behavior in the book. It is accepted that for cheating, women think that they are emotionally neglected and that they exhibit cheating behavior in order to eliminate this neglect and increase their self-confidence (Norment, 1998). It is thought that revenge behavior is exhibited by cheating on one character first and then the other. It has not been observed that there is a sincere relationship based on love and respect for each other between the characters of Osman and Nermin, who cheat on each other. In addition, it is observed that Osman does not inform anyone about the factory, which has been on rocks for a while. Secrets within the family can often negatively affect family members.
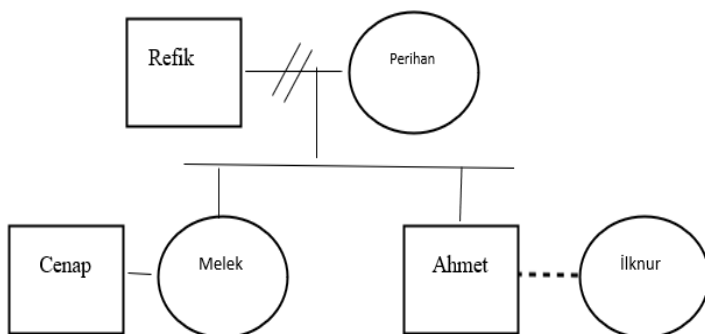

Figure 7: Genogram between Ahmet and İlknur

The ongoing relations of the partners with each other without a marriage bond are shown with dashed lines. As seen in the table above, the characters İlknur and Ahmet in the novel live together without a marriage bond. This is shown by connecting them with dashed lines on the genogram. In addition, the relationship of Nusret Bey, who became a lover to Mademoiselle Mari after he broke up with his wife, can also be shown with dashed lines.

Conclusion

Published in 1982 and won two different awards, Cevdet Bey and His Sons, the first novel of Orhan Pamuk, one of the most important writers of Turkish literature, has special importance not only in the field of literature but also in many areas such as family counseling and individual counseling since we can easily examine the genogram. Genogram, which can be used in many areas such as family counseling, and career counseling, especially in individual and couple counseling, is one of the frequently encountered materials in the field. The genogram is based on the detailed examination of at least three generations and the detection of the emotional tides of the family in intergenerational contexts. In the novel Cevdet Bey and His Sons, it is found that three generations are described in detail in terms of many factors. Although three different generations exhibit different characteristics in many respects, it has been determined that almost every individual in the genogram has some common features, and it has been revealed that similar situations are repeated in certain processes. The fact that many men in the family have alcohol addiction and care for someone who needs help in the family, which continues for generations, leads to the conclusion that family members have similar characteristics. The existences of partners who have close relations in the family are observed, as well as the existence of partners who are far from each other and keep secrets from each other. According to the relationship status in the family, information about how individuals communicate with each other and the distance they establish in communication can also be obtained from the novel. It can be observed from the generated genogram table that these communication attitudes within the family progress in the same way in each generation. The presence of recurring toxic events and twists in each case indicates to the researchers that only the names of the characters and the time they lived have changed, as the events continued. Although the novel is primarily in the field of literature, it has also gained an important place in fields such as family counseling by providing the opportunity to clearly examine the genogram used, especially in family and couple counseling.

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